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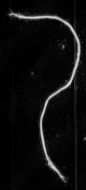

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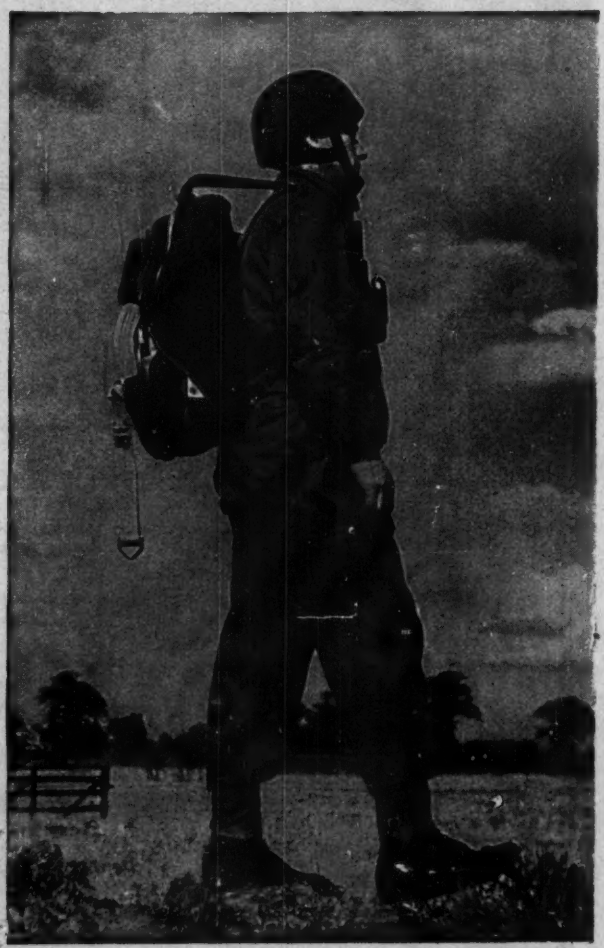

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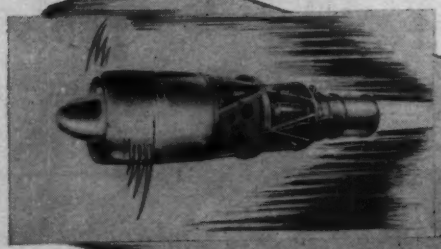

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SECRETARY'S NOTES

ANNIVERSARY MEETING

The Anniversary Meeting will be held at 3.0 p.m. on Tuesday, 8th March, 1949. The Council will present their Annual Report and Accounts, and there will be an election to fill the vacancies on the Council. Copies of the Annual Reports and Accounts for 1948 can be obtained on application to the Secretary.

AMENDMENT TO BYE-LAWS

Consequent on the Dominion Status of India and Pakistan, and the partition of the former Indian Army, it is no longer appropriate that there should be a Member of the Council representing that Service. The Council will, therefore, propose at the forthcoming Anniversary Meeting, the following amendment to the Bye-Law governing their composition :—

Bye-Laws, Chapter III, paragraph 2 (*a*), to be amended to read :—

" The Council shall be a representative one and the elected Members shall be as follows : Naval Members seven . . . ; *Army* Members ten, to include six representing the Regular Army, and *four* representing the Territorial Army—the *Army* Members should, as far as possible, be representative of the various Arms ; Air Force Members four . . . ."

COUNCIL

Elected Members

Admiral Sir Henry Moore, G.C.B., C.V.O., D.S.O., has been elected a Naval Member of the Council in the vacancy caused by the resignation of Admiral Sir Harold Burrough, K.C.B., K.B.E., D.S.O.

Field-Marshal Sir Claude Auchinleck, G.C.B., G.C.I.E., C.S.I., D.S.O., O.B.E., L.L.D., has been elected a Member of the Council in the vacancy caused by the election of Field-Marshal Lord Wilson of Libya to be a Vice-President.

Major-General L. O. Lyne, C.B., D.S.O., has been elected a Member of the Council in the vacancy caused by Field-Marshal Sir William Slim having become an Ex-Officio Member of the Council as Chief of the Imperial General Staff.

Lieutenant-Colonel R. D. Judd, D.S.O., M.C., has been elected a Member of the Council in the vacancy caused by the resignation of Colonel F. D. Samuel, C.B.E., D.S.O.

The following Members, having completed three years service, retire at the Anniversary Meeting :—

ROYAL MARINES

General Sir Dallas Brooke, K.C.B., C.M.G., D.S.O.

ROYAL NAVAL VOLUNTEER RESERVE

*Captain Rex Janson, V.D., R.N.V.R.

REGULAR ARMY

*General Sir Evelyn Barker, K.B.E., C.B., D.S.O., M.C.

TERRITORIAL ARMY

*Brigadier J. A. Longmore, C.B.E., T.D., D.L.

INDIAN ARMY

General Sir S. F. Muspratt, K.C.B., C.S.I., C.I.E.

ROYAL AIR FORCE

*Marshal of the Royal Air Force Lord Newall, G.C.B., O.M., G.C.M.G., C.B.E., A.M.

*Air Chief Marshal Sir James Robb, K.B.E., C.B., D.S.O., D.F.C., A.F.C.

Of the above, those marked * offer themselves for re-election, for which they are eligible.

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Ex-Officio Members

Major-General E. O. Herbert, C.B., C.B.E., D.S.O., has accepted the invitation of the Council to become an Ex-Officio Member on taking up the appointment of Director-General of the Territorial Army.

Captain J. W. M. Eaton, D.S.O., R.N., has accepted the invitation of the Council to become an Ex-Officio Member on taking up the appointment of Director of the Royal Naval Staff College.

Air Vice-Marshal J. D. I. Hardman, C.B., O.B.E., D.F.C., has accepted the invitation of the Council to become an Ex-Officio Member on taking up the appointment of Commandant of the R.A.F. Staff College.

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The following officers joined the Institution during the period 1st November, 1948, to 31st January, 1949 :—

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Lieutenant C. C. Ollivant, R.N.
Lieutenant J. H. Pennell, R.N.
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Lieutenant R. N. Bhattasali, R.I.N.
Sub-Lieutenant A. J. Dale, R.N.
Captain G. C. N. Bishop, Royal Marines.
Captain R. S. Warne, C.B.E., R.N.
Lieutenant-Commander M. G. Haworth, D.S.C., R.N.
Commander C. K. S. Aylwin, R.N.
Lieutenant P. W. Spencer, D.S.C., R.N.

ARMY

Major Mohammad Gulsher, 4th Bn. 14th Punjab Regiment.
Captain Jogindar Singh, R.I.A.S.C.
Major J. S. Mundy, Royal Artillery.
Captain D. Reynolds, The East Yorkshire Regiment.
Captain A. T. H. Cripps, 10th Royal Hussars.
Major R. J. Griffith, M.C., 10th Royal Hussars.
Captain J. R. Rahilly, Royal Signals.
Captain F. Blofeld, Royal Artillery.
Captain K. W. Hedges, Royal Artillery.
2nd Lieutenant J. R. S. Mather, The Somerset Light Infantry.
Captain G. P. M. Clift, Royal Artillery.
Colonel W. E. B. Dansie, O.B.E., R.A.O.C.
Captain H. P. Lawrence, The Suffolk Regiment.
Major S. J. Smith, Director of Army Legal Services, War Office.
2nd Lieutenant I. R. C. Baillie, Royal Artillery.
Captain A. G. Bond, The King's Dragoon Guards.
Brigadier S. A. Cooke, O.B.E., The Royal Lincolnshire Regiment.
Captain R. A. Keene, M.C., The Oxfordshire & Buckinghamshire Light Infantry.
Captain J. A. Sellers, The Royal Berkshire Regiment.
Captain T. H. Hill, R.A.S.C.
Lieut.-Colonel R. N. Lauder, R.A.S.C.

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Captain S. W. Girling Budd, The Royal Fusiliers.
Captain E. J. Roche-Kelly, The Border Regiment.
Major G. R. G. Bickley, Royal Artillery.
Captain F. G. Robson, 3rd Regiment, R.H.A.
Captain G. E. McLoughlin, South African Artillery.
Captain P. R. G. Young, 4th Queen's Own Hussars.
Captain M. J. A. Clarke, The East Surrey Regiment.
Major W. M. Allen, The Royal Berkshire Regiment.
Captain T. J. Bowen, M.C., The Worcestershire Regiment.
Captain M. Afsar-Uddin.
Lieutenant G. Bowden, The King's Royal Rifle Corps.
Captain M. A. Gallaghan, The East Lancashire Regiment.
Major R. W. T. Britten, M.C., Royal Engineers.
Major M. R. J. Burke, The East Yorkshire Regiment.
Major A. F. Flatow, Royal Tank Regiment (T.A.).
Lieut.-Colonel G. V. Hayward, R.E.M.E.
Major A. F. J. G. Jackson, The Royal Leicestershire Regiment.
Lieutenant P. J. H. Leng, M.C., Scots Guards.
Major E. Warrington Lloyd, T.D., The Royal Fusiliers.
Lieutenant I. R. MacKinnon, 3rd Carabiniers.
2nd Lieutenant G. Markham, The Life Guards.
Major D. A. Pringle, Royal Signals.
Captain R. C. Robertson-MacLeod, M.C., The Queen's Own Cameron Highlanders.
Lieutenant J. S. Salt, Southern Rhodesia Staff Corps.
Lieut.-Colonel G. M. C. Sprung, M.C., Canadian Forces.
2nd Lieutenant J. B. Stokes, 19th F.D. Regiment, R.A.
Lieut.-Colonel C. J. Tobin, C.B.E., R.A.O.C.
Major J. C. White, M.C., The South Staffordshire Regiment.
Colonel J. M. F. Cartwright, C.B.E., Royal Artillery.
Lieutenant I. B. Church, Royal Signals.
Captain P. A. E. Jones, The Royal Welch Fusiliers.
Captain I. N. Kendal, D.F.C., Royal Artillery.
Major J. D. Maling, D.S.O., M.C., Royal Artillery.
Lieutenant V. F. Worlledge, Royal Engineers.
Brigadier G. S. Thompson, D.S.O., M.B.E., Royal Artillery.
Major J. F. Willcocks, Royal Artillery.
Lieutenant J. W. Brown, The East Lancashire Regiment, att. R.A.O.C.
Major W. J. Armstrong, R.E.M.E.
Lieutenant H. S. Ball, 3rd Carabiniers, R.A.C.
Major J. A. Jewson, R.A.S.C.
Lieut.-Colonel R. D. Judd, D.S.O., M.C., 263 Anti-Tank Regiment, R.A. (T.A.).
Captain J. N. Shipster, D.S.O., The Middlesex Regiment.
Brigadier J. S. Blunt, Royal Artillery.
Lieutenant A. W. C. Culbert, The Cheshire Regiment (late K.O.S.B.).
Captain J. H. T. Reynolds, R.E.M.E.
Captain E. A. H. Jeffcoat, The Middlesex Regiment.
Lieut.-Colonel L. R. Oake, C.B.E., D.L., Secretary, Territorial and Auxiliary Forces Association of the County of London.
Captain C. J. Wetherall, R.A.S.C.
Lieut.-Colonel L. H. Rush, R.A.S.C.
Major W. P. M. Allen, M.C., The Middlesex Regiment (D.C.O.).
Captain F. J. Jefferson, Grenadier Guards.
Captain F. R. B. Wordsworth, The Life Guards.
Captain M. F. Leonard, The Middlesex Regiment (D.C.O.).

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Captain J. E. Tull, The Royal Hampshire Regiment.
Lieut.-Colonel V. P. Northam, 16th Punjab Regiment.
Captain Ibn Yacob, 16th Punjab Regiment.
Major B. G. Butterworth, Royal Artillery.
Major P. M. Victory, M.C., Royal Artillery.

ROYAL AIR FORCE

Flight Lieutenant A. C. Hollingsworth, R.A.F.
Flight Lieutenant V. G. Owen-Jones, D.F.C., R.A.F.
Squadron Leader D. C. Goodrich, R.A.F.
Flight Lieutenant D. J. Hughes, R.A.F.
Squadron Leader K. W. J. Tarrant, D.F.C., R.A.F.
Squadron Leader R. G. B. Summers, A.F.M., R.A.F.
Flight Lieutenant P. W. Gilpin, D.F.C., R.A.F.
Flight Lieutenant A. T. Edwards, R.A.F.
Flight Lieutenant A. J. H. Kitley, R.A.F.
Squadron Leader G. L. Cochrane, R.A.F.
Squadron Leader D. T. M. Lumsden, R.A.F.
Flight Lieutenant C. J. Lawrence, R.A.F.
Flight Lieutenant D. J. Hughes, R.A.F.
Flight Lieutenant D. W. Bryant, D.F.C., R.A.F.
Squadron Leader W. T. H. Howell, D.F.C., R.A.F.
Flight Lieutenant J. Harris, D.F.C., R.A.F.
Flight Lieutenant H. Bennett, R.A.F.
Flight Lieutenant G. Clubley, R.A.F.
Flight Lieutenant I. L. Dunn, R.A.F.
Flight Lieutenant P. A. Kennedy, D.S.O., D.F.C., R.A.F.
Flight Lieutenant A. M. J. Kent, R.A.F.
Wing Commander A. D. Forster, D.F.C., R.A.F.
Wing Commander L. H. Snelling, A.F.C., R.A.F.
Squadron Leader D. F. Spink, R.A.F.
Flight Lieutenant E. B. Townend-Dyson, R.A.F.
Flying Officer J. F. H. Baylis, R.A.F.
Squadron Leader F. H. Kelly, M.B.E., R.A.F.
Squadron Leader G. F. Rogers, O.B.E., R.A.F.
Flight Lieutenant R. S. Sanders, D.F.C., R.A.F.
Flight Lieutenant F. C. D. Wright, D.F.C., R.A.F.
Wing Commander E. C. Badcoe, D.F.C., R.A.F.
Flight Lieutenant R. W. M. Sennitt, R.A.F.
Squadron Leader G. Kennedy, F.D.C., D.F.M., R.A.F.
Flight Lieutenant A. W. Jennings, D.F.C., R.A.F.
Squadron Leader P. J. S. Finlayson, R.A.F.
Squadron Leader J. A. Brignell, D.F.C., R.A.F.
Squadron Leader V. B. de la Perrelle, R.A.F.
Wing Commander C. V. Winn, D.S.O., D.F.C., R.A.F.
Flight Lieutenant N. A. J. Mackie, R.A.F.
Flight Lieutenant N. Varanand, R.A.F.
Flight Lieutenant A. R. M. Watts, R.A.F.
Wing Commander G. C. O. Key, O.B.E., D.F.C., R.A.F.
Squadron Leader S. R. Peacock-Edwards, D.F.C., R.A.F.
Flight Lieutenant F. H. Fearnside, R.A.F.
Squadron Leader C. P. Waddell, R.A.F.
Air Commodore T. B. Prickman, C.B.E.

CIVIL FUNCTIONARY

D. S. Ross, Senior Accountant, Admiralty.

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PRIZE MEMBERSHIP

Free membership for five years is now awarded to one officer in each Passing Out Course from the Royal Naval College, Greenwich, the Royal Military Academy, Sandhurst, and the Royal Air Force College, Cranwell.

Three nominations per annum for these memberships can be made by the President of the Royal Naval College and the Commandants of the other two Colleges.

The following awards have been made to date :

NAVY

1947 :
Sub-Lieutenant R. B. Montclare, R.I.N.
Sub-Lieutenant W. E. C. Perkins, R.N.
Sub-Lieutenant P. R. D. Kimm, R.N.

1948 :
Sub-Lieutenant W. le G. Jacob, R.N.
Sub-Lieutenant D. R. Reffell, R.N.
Sub-Lieutenant A. J. Dale, R.N.

ARMY

1948 :
2nd-Lieutenant J. Marshall.
2nd-Lieutenant J. R. S. Mather.

ROYAL AIR FORCE

1948 :
Flight Cadet J. E. Y. King.
Flight Cadet H. R. W. Morris.

INCREASE OF SUBSCRIPTIONS

As from 1st January, 1948, the rates of subscriptions were increased to :—

Annual Subscription	£1 10 0
Life Subscription	£24 0 0
or four yearly instalments of	£6 6 0 each
Covenanted Life Subscription—Seven yearly instalments of	£3 12 0 each

Annual Members who have not yet instructed their banks to pay the new rate of subscription are requested to do so without delay. If they ask, they can be supplied with new bankers orders, in which event they are requested to send the requisite remittance to make up the amount due for the current year at the same time.

Members who are in process of paying their Life Subscriptions by yearly instalments are not called upon for any increase.

COVENANTED SUBSCRIPTIONS

The Council hope that many more Members will support the Scheme for Covenanted Subscriptions, details of which have been circulated to all Members.

This materially assists the Institution because it enables Income Tax at the full current rate to be reclaimed on each subscription.

To date, 1,402 Annual and 674 Life Members have signed the necessary Deeds.

Any Member who has not received his copy of the Scheme or who requires new forms is requested to communicate with the Secretary.

LIAISON OFFICERS

With the object of making the facilities afforded by membership of the Institution better known to the Services, the Council have invited the principal Commands at Home and Overseas to nominate Liaison Officers.

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It is also hoped that the Liaison Officers will be able to suggest, from time to time, ways in which the Institution can be of greater value to the serving officer.

Liaison Officers have been provided with Particulars of the Institution and forms to enable them to enrol members without further formality.

The following is a list of officers who have been nominated as Liaison Officers and the Commands or Establishments they represent :—

Establishment or Command	*Name*
Combined Operations Headquarters	Lieut.-Colonel G. I. Burgess-Winn, O.B.E.
School of Combined Operations ...	Lieut.-Colonel J. S. Humphrey, M.B.E.
NAVY	
Home Fleet	Lieut.-Colonel G. W. Ross, R.M.
Flag-Officer Air (Home)	Captain S. J. S. Boord, R.N.
R.N. College, Greenwich	Lieutenant-Commander J. K. Hamilton, R.N.
Flag Officer, Scotland and Northern Ireland.	Commander D. E. G. Wemyss, D.S.O., D.S.C., R.N.
H.M.S. " Excellent "	Lieutenant-Commander A. D. Bulman, R.N.
H.M.S. " Dryad "	Commander F. B. P. Brayne-Nicholls, D.S.C., R.N.
Flag Officer, Submarines ...	Commander R. M. Favell, D.S.O., R.N.
Reserve Fleet	Lieutenant-Commander P. E. Muers, R.N.
R.N. Barracks, Chatham ...	Lieutenant-Commander R. Abram, R.N.
R.N. Barracks, Portsmouth ...	——
R.N. Barracks, Devonport ...	Lieutenant-Commander P. C. S. Black, D.S.C., R.N.
R.M. Barracks, Chatham... ...	Lieut.-Colonel J. M. Phillips, R.M.
R.M. Barracks, Eastney ...	Major E. A. Allenby, R.M.
R.M. Barracks, Plymouth ...	Captain P. L. Mackay, R.M.
Mediterranean Station	——
ARMY	
Anti-Aircraft Command	Lieut.-Colonel H. C. Withers, M.C.
Eastern Command	Lieut.-Colonel G. W. H. Peters, D.S.O., M.C.
Northern Command	Lieut.-Colonel D. P. St. C. Roissier, O.B.E.
Scottish Command	Lieut.-Colonel W. S. Ritchie, O.B.E.
Western Command	Major R. B. Hodgkinson, M.C.
Southern Command	Lieut.-Colonel K. T. Roper.
London District	Major H. G. B. Knight, M.C.
Northern Ireland District ...	Major G. P. Rickcord, D.S.O.
British Troops in Austria ...	Lieut.-Colonel L. H. Spicer.
B.A.O.R.	Colonel A. D. Miller, D.S.O.
Far East Land Forces'	Colonel N. W. Finlinson, D.S.O.
ROYAL AIR FORCE	
Bomber Command	Group Captain R. A. T. Stowell, D.F.C.
Fighter Command...	Flight Lieutenant P. G. Leggett.
Coastal Command	Group Captain M. F. D. Williams, D.S.O.
Flying Training Command ...	Wing Commander C. G. Milne, D.F.C.
Technical Training Command ...	Wing Commander E. F. Tonge.
Transport Command	Wing Commander J. A. Crockett.
Maintenance Command	Group Captain J. H. Powle, O.B.E.
Air Command Far East	Wing Commander W. N. Elwy-Jones.

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TRENCH GASCOIGNE PRIZE ESSAY COMPETITION, 1948

The Council, having received the reports of the Referees, have decided that none of the essays submitted for this Competition is up to the standard which would justify the award of the Gold Medal of the Institution or the full prizes. They have, therefore, made the following awards :—

For the essay placed first in order of merit :—
£15 15s. od. to Major the Lord Wynford, p.s.c.

For the essays bracketted next in order of merit :—
£5 5s. od. to Commander E. V. St. J. Morgan, D.S.C., R.N.
and to Wing Commander S. G. Walker, O.B.E.

The following Essays were received :—

" Ichabod."
" Valour that parleys is near yielding."
" Let us hear the conclusion of the whole matter; Fear God and keep His commandments, for this is the whole duty of man."
" Tria Juncta in Uno."
" Vis Consili Expers Mole Ruit Sua."
" When their Judges are overthrown in stony places, they shall hear my words."
" Strike Hard—Strike Sure."
" Arma Virumque Cano."
" Si vis Pacem para Bellum."
" All Wisdom is not New Wisdom."
" Facilis Descensus Averno."
" Vis Unitate Forlior."
" De l'audace, et encore de l'audace."
" Themistocles."
" The Seas shall Unite them."
" Together we stand, divided we fall."
" Hope for the Best, Prepare for the Worst."
" When a strong man armed keepeth his Palace, his goods are in Peace."
" Be Cheerful also, and seek not external help nor the tranquility which others give."
" In quietness and confidence shall be your strength."
" October Twilight."
" Cry Havoc."

TRENCH GASCOIGNE PRIZE ESSAY COMPETITION, 1949

Particulars of this competition will be found in the leaflet in this JOURNAL.

MUSEUM

ADDITIONS

Ship's Badge from H.M.S. " St. Kitts " (9392) and a White Ensign from H.M.S. " York " (9393). Given by Able-Seaman W. C. Parker.

Officer's tunic of The West Indian Regiment (9394). Given by Mrs. P. H. Biscoe.

An ebony ruler belonging to the late Captain Robert Fanshawe, R.N., Commissioner at Plymouth from 1789-1815, bearing the seal used by the Treasurer of the Navy (9396). Presented by Lieut.-Colonel L. Sturt.

CORRECTION

(9385) Flag of Admiral Sir Lewis Bayly, K.C.B., K.C.M.G., C.V.O., which he flew on more than one occasion in U.S.S. " Cushing " in 1917 (not 1817, as in the November JOURNAL).

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LOANS

Two rapiers, one broadsword and an officer's small sword lent by the Victoria and Albert Museum in exchange for an Italian wheel-lock fowling piece and a double-barrelled long wheel-lock pistol.

A naval General Service Medal with six clasps awarded to Lieutenant Thomas Woods, R.N., in 1849, deposited by Colonel T. A. Woods.

JOURNAL

Members are invited to offer suitable contributions for the JOURNAL. Confidential matter cannot be used, but there is ample scope for professional articles which contain useful lessons of the War; also contributions of a general Service character, such as Strategic Principles, Command and Leadership, Morale, Staff Work, Naval, Military and Air Force history, Customs and Traditions.

The Editor is authorized to receive articles from serving officers, and if found suitable, to obtain permission for their publication from the appropriate Service Department.

Army Officers are reminded that such articles must be accompanied by the written approval of the author's Commanding Officer.

SALE OF SURPLUS JOURNALS

There is an excessive stock of *some* of the back numbers of the JOURNAL from 1869 to 1944, inclusive.

These can be supplied at 1s. each, post free. Applications, stating the exact JOURNAL (year and month) required, should be made to the Secretary.

CANCELLED LECTURE

The lecture on "The Effect of Political Changes in Southern Asia on Imperial Defence," which was to have been given by Field-Marshal Sir Claude Auchinleck, on 5th January, had to be cancelled. It will not, therefore, appear in the JOURNAL.

CHANGES OF ADDRESS

Members are particularly requested to notify any change of address which will affect the despatch of the JOURNAL.

Naval Officers are strongly advised to keep the Institution informed of their address, as JOURNALS sent to them via C.W. Branch of the Admiralty are invariably greatly delayed.

FOR SALE

THE NEW NAVAL SIGNAL CODE

A limited number of spare copies of the coloured frontispiece of the JOURNAL for November, 1948, showing all the flags of the New Naval Signal Code, are available to members at 1/- each, post free.

"WHAT TO READ"

The articles on "What to Read," which have appeared in the JOURNAL, have been brought up to date and published in pamphlet form. Copies can be supplied, price 1s. 6d., post free.

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Imperial War Museum Photograph

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Royal United Service Institution

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[Authors alone are responsible for the contents of their respective Papers. All communications, except those for perusal by the Editor only, should be addressed to the Secretary, Royal United Service Institution.]

AIRBORNE FORCES

By MAJOR-GENERAL A. J. H. CASSELS, C.B.E., D.S.O.

On Wednesday, 1st December, 1948, at 3 p.m.

GENERAL SIR WILLIAM J. SLIM, G.B.E., K.C.B., D.S.O., M.C., in the Chair

THE CHAIRMAN: It is my pleasant duty to introduce your Lecturer this afternoon—Major-General Cassels, who is going to speak to you on Airborne Forces. He is the professional head of that branch of the Service in the British Army at the moment, and you could not therefore have a more authoritative lecturer. He has not only had experience of commanding an airborne division, but he also commanded an infantry brigade and a division in the recent war.

I must warn you that he is unable to develop very fully some of the more interesting sides of his lecture, namely, the trends of development and equipment now taking place. Even in front of an audience of this kind I am afraid I cannot allow him to go too deeply into that, bearing in mind that this lecture will be reproduced in the JOURNAL, which has a very wide circulation.

LECTURE

THE subject of this lecture is "Airborne Forces" and it is, perhaps, as well to be quite certain what we mean by this term. A brief definition is:—

"Airborne Forces are those formations and units which are specially trained and in some respects specially equipped to be delivered direct to battle by air. They and their equipment will initially be landed by parachute or glider and they must be prepared to fight immediately on landing."

You will see that the term does not include what we call air-transported forces. These are troops who are carried from A to B in a powered aircraft and are landed in that aircraft. Although they may land in the theatre of operations or even in the battle zone itself, they are not expected to fight immediately and in fact may not even be tactically loaded.

HISTORY

I do not propose to spend much time on the history of airborne forces. The Russians were really the pioneers, and you will remember seeing photographs of their mass drops in manoeuvres before the last war. In the War itself they had a

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number of airborne formations, but generally speaking they were used in normal ground roles. Two small airborne operations were staged at Vyasma in 1942, and at Kanev in 1943, but neither were successful. Apart from this, airborne forces were used by them extensively in small parties to bolster up the partisan movement and in the latter stages to occupy strategic points on the advance through Manchuria in 1945.

The Germans were impressed with the idea of airborne forces and, following the Russian lead, were ready by the beginning of the War to use them. As you all know, they operated very effectively in Holland, Norway, Greece and Crete. The Germans went a step further than the Russians because they used gliders in conjunction with parachute troops.

In Great Britain we had no airborne forces at the begininng of the War, and though their formation had been considered, it had been decided not to do so. It was not until the middle of 1940 that Mr. Winston Churchill issued orders that we should train 5,000 parachutists as quickly as possible. A small training establishment was set up by the R.A.F. and Army at Ringway near Manchester, and a small band of enthusiasts were told to get on with it. They encountered every conceivable difficulty. There was little or no equipment, and most of it and the method of using it had to be invented or improvised on the spot. In spite of everything, tremendous progress was made and, without going into all the details, it is sufficient to say that by mid-1944 we had trained :—

Two British airborne divisions.
One British independent brigade.
One Indian airborne division.
Many Allied contingents.
Special Air Service or equivalent units in all theatres.

I think you will agree that this was a great achievement and reflects the very greatest credit on all those in the R.A.F. and the Army who were responsible.

In the United States very similar advances were made and there is no need for me to tell you the great part the U.S. airborne forces played in Africa, Sicily, the Pacific and North-West Europe.

CHARACTERISTICS AND LIMITATIONS

There are many factors to consider when deciding on the numbers of airborne forces it is desirable to have and on how to use them. I intend to describe what I think are the more important ones.

The first is a somewhat intangible factor but is, I believe, as important, if not more important, than any others. It is what I call the " potential threat." The mere existence of airborne forces constitutes an ever-present threat to any enemy. He does not know when or where they are going to be used and this forces him to disperse his forces to guard many places which otherwise he could safely leave unguarded. You will remember how, in 1940, our very meagre resources were spread all over the United Kingdom to protect vital areas against German parachute attack and this at a time when we could ill afford such dispersion. Therefore it seems clear that the possession of airborne forces is, in itself, a contribution towards weakening the enemy, even without actually using them. A corollary to this is that one should try within, of course, reasonable bounds, to keep some airborne forces up one's sleeve and not commit them all at once.

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The next factor to consider is the capabilities of an airborne formation. The airborne division, for example, is organized on almost exactly similar lines to the infantry division. However, it is impossible, at present, to deliver the heavy equipment and vehicles of the division to battle by air in the assault stage. Therefore, until this equipment is delivered the division is much weaker than an infantry division. When landed, airborne formations are comparatively immobile and take some time to collect and be ready to fight in units; they lack firepower and are necessarily on low scales of ammunition. The moral of all this is that airborne formations should not be landed in areas where strong and immediate opposition is expected, and the tasks given to them must be smaller than those expected of a normal infantry formation.

Another factor of great importance is the weather. This affects both parachutists and gliders, but in different ways and, of course, it affects the aircraft which are dropping or towing them. It is not yet possible for aircraft to locate dropping zones and landing zones really accurately in all conditions of weather. There is no doubt that this will be overcome in the future but, at present, it still holds good. Accuracy of drop or landing is most important and therefore bad weather will prejudice or may well postpone the operation. This must be allowed for in the planning, as a postponement will generally affect many other forces besides the airborne. Two other weather factors must be watched—the wind and clouds. The wind affects the parachutist as, if he is dropped in high wind, his chances of landing intact decrease rapidly. In training we do not allow drops in windspeeds of over 15 m.p.h. In operations naturally one must accept greater risks but, as a yardstick, it can be said that if you drop in winds over 25 m.p.h. the chances are that the casualty rate on landing will be too great to allow the unit a fair fighting chance to carry out its job. In this connection a steady wind is far better than a gusting wind, i.e. a 20 m.p.h. wind gusting now and then to 30 is more likely to cause casualties than a steady 25 m.p.h. wind. To give an indication of the shock on landing, it is roughly the equivalent of jumping off the top of a train which is moving at the speed of the wind. Clouds, on the other hand, are a menace to the glider. Unless the glider pilot can see his tug-aircraft, it is extremely difficult for him to keep his correct towing position, with the result that he may crash into the tug or break his tow rope. Therefore any prolonged flying through clouds is not a practical proposition at present, though promising methods of overcoming this limitation are now in hand.

You can see therefore that good meteorological forecasts and flexible planning are very necessary when mounting an airborne operation.

The next factor I propose to consider is again somewhat intangible but real enough for all that; it is the effect that the dropping of airborne troops has on the enemy's morale. I think it is fair to say that it is out of all proportion to the numbers dropped. There are many examples to show this but, to my mind, the classic one was at the end of 1944 when the Germans started their offensive in the Ardennes. At that time it was clear that we had won or at least nearly won the War—our morale was high and we were just getting ready for the final offensive. The Germans included in their offensive the dropping of a few parachutists: I am afraid I don't know exactly how many, but it was probably 300–500. I do not believe that these troops effected anything directly, but indirectly they achieved a remarkable amount. Messages flew in every direction, check posts and local guards were established everywhere between Brussels, Antwerp and the Ardennes and even as far back as Paris! To be quite frank, there was considerable alarm and despondency. All this was caused by

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a few men, and when you remember that, at that time, our morale was really high, you can imagine what effect would be caused on an enemy who was losing and whose morale was low.

We now come to the very pertinent factor of vulnerability. An airborne operation on anything except a small scale is an air operation of the first magnitude. To achieve maximum success it is desirable to drop or land as many as possible as quickly as possible. This means that a mass of comparatively slow and unarmoured transport aircraft and gliders will be flying in close formations to their target. They are very vulnerable, and their protection en route, while over the dropping and landing zones, and on the return journey is essential, and it involves the most detailed planning and absorbs very considerable fighter effort. Arrangements must be made not only to defeat the enemy fighters but also to neutralize his " flak," particularly in the target area. Parachutists, though very difficult to hit in the air, are very vulnerable when they hit the ground and are struggling to get out of their harness, collect their weapons and find their way to their unit rendezvous. Gliders are, of course, vulnerable all the time until they have discharged their cargo. There are therefore two requisites, one of which is essential and the other highly desirable, before embarking on an airborne operation : they are local air superiority and the neutralization or absence of strong enemy defences in the landing area.

Another factor to consider when deciding on the number of airborne formations required is that of expense both in manpower, in effort, and in money. In war, money is a very secondary consideration but in peace it plays a big part. Manpower is always short, both in peace and war. It is necessary therefore to realize that the training of specialists such as parachutists and glider pilots involves considerable overheads in money and manpower. The burden of such training falls almost entirely on the R.A.F. who have to provide Parachute and Glider Training Schools which, in turn, involve the provision of training aircraft and expert instructors. There is no doubt that this training is a considerable " headache " to the R.A.F., and the Army owes them a very great debt of gratitude for the way they invariably provide it. In a smaller way this problem is also a " headache " to the Army and, therefore, the aim of the future must be to devise other means of sending soldiers to battle by air and to do away with the individual parachutist and the glider. It is probable that for many years to come one will still need some individual parachutists and gliders for raids or " coup-de-main " operations but, for normal airborne operations, it is the aim to find other methods. I need not elaborate the advantages that will accrue when one can use any trained infantry formation in the airborne assault.

There are, of course, many factors other than those I have mentioned, but most of them are either common to other military formations or are so patent that they do not need discussion. For instance, the great possibility of achieving surprise and the ability to by-pass physical obstacles are self-evident and in the short time I have do not merit elaboration.

EMPLOYMENT OF AIRBORNE FORCES

I have now given you some of the advantages and disadvantages of airborne forces. I hope that, in doing so, I have not given the impression that airborne forces are an unwieldy and cumbrous weapon which can only be used after weeks of elaborate planning, and then only in very favourable circumstances. It would be quite wrong if we accepted that view. The experience we have gained, the lessons we have learnt and the constant study that is being given to the matter should and

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must lead to the quick and flexible employment of airborne forces as and when opportunity offers.

In general there are four ways of using airborne forces :—

1. The strategical or " deep penetration " role.
2. The tactical or " quick link-up " role.
3. Special operations such as raids.
4. The emergency or " last ditch " role.

The Strategical Role

The strategical role, as the name implies, involves dropping forces in an area quite apart from the land battle. The object will vary. It may be to create confusion and panic in the enemy's lines of communication area, or to seize some area which is required as a base for future operations, or to destroy or deny some area to the enemy. In any case the airborne forces cannot expect to be relieved by their own land forces for some considerable time and, therefore, they can only achieve their object in areas where the enemy is weak and where his rate or strength of build-up can be equalled by ours. As our build-up will, in such cases, have to be by air, it follows that our forces can never, with present aircraft, be really strong in tanks and heavy equipment generally. Therefore the situation must be such that the enemy is equally handicapped or that the country precludes the use of such equipment. Very good examples of the " deep penetration " role are the Wingate operations in Burma.

The Quick Link-up Role

The tactical or " quick link-up " role involves using airborne forces in direct support of the main land battle. The drop of the airborne forces is linked closely with the whole plan of the campaign and is so arranged that the ground forces should reach the airborne troops before the enemy can mass sufficient strength to destroy them. The object of such operations will generally be to seize some tactical feature or features which will assist and quicken the overall offensive, or, indeed, in some cases will allow the offensive to be staged at all. It is clear that in this role the troops will be dropping or landing into areas where the enemy is fairly strong or can be strong comparatively quickly. Therefore one must use airborne forces in reasonably large packets and must drop as many as possible simultaneously. Second and third lifts will be very chancy affairs and cannot be relied on to achieve a great deal. Similarly one must arrange for every possible form of fire support to be given to the airborne formations. This is achieved by offensive air support and by the artillery of the main battle where it is within range. It is particularly necessary to arrange for enemy *flak* to be neutralized during the approach and landing periods. Normandy, Arnhem[1] and the Rhine are all good examples of the quick link-up operation.

Special Operations

Special operations, such as raids, are comparatively easy to mount provided the information secured by Intelligence is adequate. The main problem here is generally not in the assault itself but in the evacuation after the raid. A good example is the Bruneval raid. Special Air Service operations, on the other hand, present

[1] The Arnhem operation was devised to capture 60 miles of road between Eindhoven and Arnhem. This was achieved except for the last half-mile and the Arnhem bridge. It was not intended to be a deep penetration but essentially a link-up operation. It has often been alluded to as a failure ; in fact, it was 85 per cent. successful, and a nu mber of very important bridges were captured.

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many problems of their own—probably the main ones are reliable, high-class communications and certain, accurate re-supply. Special operations of all sorts are invaluable when properly co-ordinated and done under a definite plan, but to cover them properly would need a lecture on its own and I regret that I must therefore leave them to-day.

Emergency Operations

The last use of airborne forces which I have given is what I call Emergency operations. By this I mean dropping airborne forces behind our own lines in a reinforcing role to restore an awkward situation or prevent an enemy break-through. I need not emphasize that this is a most uneconomic method of reinforcing and would clearly only be used as a last resort. The Germans, in fact, did it in Sicily and though they did delay the final capture of the island, they did not stop it. It is, perhaps, worth re-stressing the point that airborne formations, until they link up with their land or sea tail of heavy equipment, are comparatively immobile and weakly armed. Their value must be gauged accordingly.

I would like at this point to stress that there is no " black magic " about airborne forces. They are perfectly normal formations who are delivered to battle by air instead of by other means. Because they are volunteers and because they will have to fight in more unusual circumstances than most others, they may well develop a greater individual initiative than some other formations. Apart from this they are an ordinary Army formation and their employment is governed by all the normal major principles of war.

Some Principles

There are, however, a few minor principles which have emerged as a result of lessons learnt in the last war. I think the more important ones are :—

(*a*) Do not use airborne forces just for the sake of using them. Remember their characteristics and limitations and use them on a worth-while task which cannot be done equally well by ground forces. If ground forces can do the task but their use would cause undue casualties, or unacceptable delay, or involve an uneconomic number of troops, then of course it is a worth-while task for airborne forces.

(*b*) If possible, drop or land your airborne forces in one lift and always arrange for an immediate and automatic re-supply as soon after the assault drop as possible.

(*c*) Try to relieve the airborne forces as soon as possible so that they can equip and prepare for the next operation and restore " the potential threat " which I mentioned earlier. In practice this principle is extremely difficult to achieve. [1]

(*d*) The theatre Commander and his A.O.C.-in-C. must look well ahead and anticipate the situations where airborne forces can profitably be used. The planning of an airborne operation must, unfortunately, take longer than a normal ground operation. By planning possible tasks well ahead a great deal of time can be saved. A corollary to this is that an airborne formation must be prepared to make many plans which may never be used and, more important, must

[1] In the Normandy landings, it was the intention that the 6th Airborne Division should be relieved and returned to the United Kingdom on or about D + 7. In fact they were not relieved and returned until about D + 90.

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accept the fact that it will be "stood to" and "stood down" on many occasions.

(*e*) Last, but by no means least, it is vital to bring in the A.O.C.-in-C. in the theatre and his staff at the inception and formulation of any plan to use airborne forces In the end it is only the R.A.F. who can say whether the project can be launched or not. Similarly, the airborne formation commander must make his plan in the closest possible conjunction with the A.O.C. of the transport aircraft which are carrying him.

EARLY RELIEF VIS-À-VIS BATTLE EXPERIENCE

I would like to digress for a moment here to discuss the question of early relief of airborne forces vis-à-vis the need to give the troops battle experience. I have often been asked: "If you always relieve your airborne forces early, how will they ever gain battle experience? Is it not essential that they should be left in the battle for some time so that they can gain experience?" My personal opinion is that battle experience can be overdone. It is, I believe, essential to have some battle-experienced leaders spread through the formation. It is quite vital that training should be realistic and based on the peculiarities and lessons of the theatre in which one is going to fight. I am not at all convinced that a formation of battle-experienced veterans is a good thing. It is remarkable how quickly one learns in battle, and the more one learns the more cautious one is apt to become. My own experience is that the well-trained soldier is better in his first battle than in any other. Therefore I would say that, provided training is good, it will pay to get airborne troops relieved early. They will learn all that is necessary in the brief but hectic time they are engaged and will be comparatively fresh for the next venture. As I said before, it is, in practice, difficult to achieve this, but I still believe it should be the aim.

FUTURE DEVELOPMENTS

You will have realized from what I have said that there are certain factors which limit or affect the employment of airborne forces.

To recapitulate, they are:—

(*a*) The inability to drop or land heavy equipment in the assault phase.

(*b*) The somewhat complicated training machinery and effort required to train the individual parachutist and the glider pilot and, as a corollary, the future aim to devise means of doing away with them.

(*c*) The dependence on certain weather conditions for the glider and the dropping of the parachutist.

(*d*) The difficulty of locating defence zones or landing zones accurately in all types of weather or light and therefore dropping or landing troops in the right place.

(*e*) The difficulty of rallying troops quickly to their correct rendezvous whether dropped accurately or not.

All these problems are being very actively studied and, with the development of bigger and better transport aircraft, the use of the heavy freight container which can be dropped (of which you have probably seen photographs in the Press), the potential value of the heavy-lift helicopter and the various advances in navigation and directional aids generally we hope to overcome or reduce the above limitations very considerably.

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THE VALUE OF AIRBORNE FORCES

There are, I think, a number of people who still question the value of having airborne forces and condemn them as an expensive luxury. I hope I have shown you that, though they have their limitations like anybody else, they can on certain occasions achieve things which could really be done by nobody else and, on other occasions, they can be a considerable help and time-saver in a land battle and may save innumerable casualties. However, you will say that I am biassed. In answer I can only say that immediately after the War the C.I.G.S.—Field-Marshal Lord Alanbrooke—asked some of the senior theatre commanders who had had experience of airborne forces for their opinion on this very point. I am glad to say that the opinion was unanimous that no army could be considered modern or complete without an airborne forces element. The only points I would like to stress are :—

(*a*) Airborne forces must not be regarded, nor indeed regard themselves, as a " private army." They are just another type of army formation. At one time the armoured division was regarded as something very special and difficult to understand. The last war cured that and I hope that the airborne division is, and will be, seen in the same light.

(*b*) All commanders and staff officers must understand the limitations and uses of airborne forces. It is only by this means that full value will be obtained from them and opportunity tasks exploited. One must get away from the idea that airborne forces are a cumbrous weapon only to be used two or three times in the war and then in enormous mass. They must be regarded as a highly flexible weapon capable of being used at reasonably short notice.

THE AIRBORNE SOLDIER

Finally I would like to say a word about the airborne soldier. In the War, perhaps naturally, his exploits were very much written up, and as a result he was apt to be regarded by those who did not know him as very brave but nevertheless a peculiarly tough and ruthless " thug." I would like to give you the real picture. In fact, he was a very normal and, in the vast majority of cases, a good soldier. He was a volunteer. He had, because of his trade, to be very fit and hard physically. His particular training encouraged a spirit of adventure and developed his initiative. However, first and foremost, he was and is trained to be an efficient soldier. In view of being a volunteer and his special training it is likely that he is above the average standard. He is intensely proud of his airborne unit and therefore of himself. As a result he may appear and often is somewhat bumptious and swaggering to others. Nevertheless I am sure that all who served with or near him in the War or since will agree that he is a most useful man to have with you in any tight spot, and moreover he is a great companion at all times. From my experience I can honestly say that I have never served with finer soldiers.

I have tried, in the short time available, to give you some idea of the history, problems and uses of airborne forces and the men in them. There are, of course, many other matters, particularly the details of planning, which I have not had time to mention. I hope, however, if there are any particular points that you wish to know that you will not hesitate to ask and I will do my best to give you the answer.

THE CHAIRMAN

If you will be indulgent with me I should like to reverse the usual order and make such few remarks as I have to make now, because unfortunately I have an appointment

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at four o'clock which I must attend. After I have gone I am sure Major-General Cassels will deal very adequately with the Discussion.

I share with Major-General Cassels the idea of the value of airborne forces. I do not think there is any force of comparable size that can have so great an effect on a campaign as a really efficient, well-trained airborne force. That this is so is very largely due to the effect it has upon the mind of the opposing commander, because making an effect on the mind of the opposing commander is to gain a most important advantage over him.

I have had it both ways. I have been in command of an Army with no airborne force when the other fellow had airborne troops, and I have also been in command of an Army which had some airborne troops which we were in a position to deliver. Believe me, the effect on a commander can be very great. It is all very well saying " Oh, they are only going to put down a small packet " ; but a small packet at a vulnerable point counts very much, and unless a commander is very careful the mere threat of an airborne attack will lead to a very serious dispersal of force. If you are at all wide awake to these things you can, by the use of suitable deception measures, create and magnify that effect on the opposing commander, even when you have only got a small airborne force of your own. We did that with the Japanese. I admit that it was not so difficult to frighten them in that way ; one thing, however, which should always be borne in mind is the possibility, by means of deception, of convincing the enemy that you are going to carry out an airborne landing somewhere, or more than one, and make him disperse and get him worried. You can force an enemy to become very jittery by that means.

One other point which Major-General Cassels, perhaps obviously, did not mention is the type of commander required for an airborne force. Such a commander is very difficult to find, because he must be the type who is, if you like, a little bit picturesque, adventurous and something of a swashbuckler—although perhaps Major-General Cassels will not agree with me—and one who appeals to the imagination of his troops, because airborne forces are inevitably imaginative. At the same time he must be very far-sighted, clear-headed, calm, cool and collected. Such commanders are not easy to come by. Luckily we belong to a race which produces people like that, and I do not think we need ever be short of them. If you ever have anything to do with it, be very careful how you select your airborne commanders.

One thing that these commanders have to endure is a great strain on their nerves. I do not mean the mere fact of being pitched out of an aeroplane—a thing which would fill me with horror. I am thinking of the suspense of waiting to hear how the operation goes. I remember an airborne operation in 1945 : we had a bit of bother when it started off because we suddenly discovered the landing area was blocked by the Japanese, and so I had to make a very hurried decision and send the airborne force somewhere else—perhaps not quite so good. I spent one of the most uncomfortable nights of my life on the airfield waiting for news of the drop, and to know if the gliders had got in. To start with, the only reports I got were of red lights going up all over the countryside, and of gliders crashing in our own lines ; these reports were not very helpful. There was one desperate battle when a glider crash-landed behind our lines but the occupants, under the impression that the glider had landed on the wrong side of the line, refused to surrender to our own people. We waited and waited and nothing happened. We had various code words with the leading brigade about what had happened to them, the final one being " Soya-link," which meant almost disaster. (Soya-link was an unpalatable form of food we had which anyone there would associate with disaster anyway.). I remember waiting for some word, when a fellow came in from the little signal office with a message ; it was " Soya-link." We then were faced with the decision whether to go on or stop. We went on, and the message proved to be unduly pessimistic.

That experience taught me that the strain of waiting the result of an airborne landing is very severe, and also the need for a commander with pretty good nerves. That is one of the reasons why the selection of commanders for airborne forces must be made very carefully.

As you know, we in the British Army now are very reduced in many ways, but we are still preserving the airborne forces as much as we can; we are continuing the research and development, which is in the very capable hands of Major-General Cassels. On your behalf, I thank him for the lecture he has given. (*Applause.*)

DISCUSSION

(The Chairman having withdrawn, the Secretary, as the Council's Representative, took the Chair.)

COMMODORE J. A. GRINDLE, R.N.: Can the Lecturer say what are the possibilities of airborne forces doing an assault with a combined operation across the sea? One of the biggest problems we have now is to defeat the shore defences; one might almost say that at the moment they are in the ascendancy. If you could put your airborne forces behind the shore defences, not only does it double the effort of linking up, but it presents us—in the Navy, anyhow—with the very much easier problem of coming in with the heavy stuff to a comparatively undefended beach.

One other aspect, which is not really my province, is that by using airborne forces you would not have the problem of reducing the leading divisions to assault scales, and then re-equipping them afterwards. I foresee the first assault being done by airborne forces, and then standard divisions being brought in by the Navy, complete with their heavy material, and "going through" the airborne forces, who will then, perhaps, be out in the seven days which is the Lecturer's ambition.

THE LECTURER: I agree absolutely that that is the best way of doing it, but you have got to weigh the limitations of airborne forces, and the enemy's reactions, to find out whether you think the airborne forces can in fact do the job. If you intend to drop them in an area where the enemy is strong in tanks, or has even got a few tanks, then the chances of that airborne formation—whatever it may be—winning the land battle sufficiently to be able to come back to the beaches and clear them become fairly remote. Therefore, from your Intelligence you have got to find out what is likely to be in the area where you are going to land your airborne forces, and whether you think they can land and defeat the enemy and then come up to the beaches and clear them with the forces and resources at their disposal. In other words, if the enemy is reasonably weak you could certainly do it, but if the enemy is very strong in that area I do not believe you could.

CAPTAIN E. ALTHAM, R.N.: Following that line of thought, if the enemy defences are very strong, might there not be some risk of dropping your airborne forces behind him, where they might get mopped up before the assault forces could get a firm footing ashore?

THE LECTURER: Yes, I think that is possible. Presumably you would not drop them very far behind the beaches. Their sole object really is to clear the beach defences and form a beach-head, thus allowing the sappers and sailors to get the mines and horrors off the beach. Therefore, the nearer they can drop to the beach and do that the better for all concerned. Equally, you must ensure that there is a quick link-up, and once the airborne forces have done their job the ordinary ground troops must be landed as quickly as possible and take over the battle with heavy tanks and heavy guns.

GROUP CAPTAIN G. C. BARRETT: The important feature of airborne forces is, of course, the threat they constitute to the enemy by virtue of their very existence, but we should remember that there is an important condition attached to that threat, namely, that airborne forces are only of use if it is possible to create an air situation in which they can be used. Faced with an adverse air situation, airborne forces are useless and are no threat whatever. As I see it, there is a corollary to this. Faced with an enemy in possession of airborne forces, the answer is not so much to have troops to put on the L. of C., but rather to form a strong Air Force and prevent the enemy airborne forces from arriving at all.

Major-General Cassels remarked that many people questioned whether airborne forces were value for money. I should like to ask whether an attempt has been made to make a balance-sheet—to cost up in terms of national effort the amount of energy which the Army and the Air Force have put into creating and training airborne forces, and whether in battle the dividend has been in proportion to that effort. If, for example, all the effort which the Air Force and the Army put into the airborne forces (right back to the factory in which the aircraft were made) had been devoted to the Air Force in the shape of direct support aircraft and heavy bombers, I wonder whether the result might have been that the 30th Corps would have reached Nijmegen, or even Arnhem, much more easily. I do not know whether anyone is in a position to answer that: probably not. I feel that for our national benefit somebody ought to make an examination on those lines, and I wondered if it had ever been done.

I am tempted to wonder whether it would not be greatly to our benefit—and I mean not just the Air Force but the Armed Forces as a whole—to consider turning the whole Army into an air-transportable Army rather than devoting a relatively small portion of it to special training in order to fight on rare occasions—occasions which may never arise at all.

THE LECTURER: In theory the whole Army is being trained in air-transportability. The difficulties are as well-known to you as to me, namely, that we have not got enough of anything to see that everybody is fully trained. You must remember, though, that an air-transportable soldier is quite different from an airborne soldier. You cannot land an air-transportable soldier in the middle of the enemy, because the aeroplane and the equipment have got to be landed on an airfield, and I suggest that is not a feasible operation of war in mass until you have done something about capturing the airfield. The fact remains that we are training particular infantry divisions to be air-transportable.

Your main question was: has anybody made a sort of balance-sheet on whether the thing is worth it or not? My answer to that is that I do not know, but I should think almost certainly not. I have, of course, heard this argument advanced before, but the fact remains that it is certainly not the view of the Army, and to the best of my knowledge and belief it is not the view of the Air Ministry. Whether you are right or wrong I do not think any man can say, but I would suggest that the one example you quoted was one that probably did your case more harm than good. Your argument was that a bigger and better bomber force could have made it easier for the 30th Corps to get to Arnhem and Nijmegen. I do not think it would, because if the bombers had not destroyed all the bridges the Germans certainly would have. You will remember the big one over the Maas, the one over the Waal at Nijmegen, and a mass of other bridges over comparatively big water obstacles, all of which were seized intact. I suggest that in no other way would we have got those bridges intact, and therefore have got to Nijmegen as fast as we could motor, instead of having to stop at every water obstacle and build a bridge. I do agree, though, that apart from that example there is obviously something in what you say, but I am afraid I am not in a position to say whether you are right or wrong. I think you are wrong.

GROUP CAPTAIN G. C. BARRETT: I think you misunderstood my example. I did not mean they should all be bombers. They might have been any form of aircraft best designed to help. For example, General Horrocks had rocket fighters to help his break-out in the first instance, and he speaks very highly of them. In fact, they made the break-out possible, I believe. Had he been able to use many more squadrons of rocket fighters it might have enabled him to advance the first time instead of having to go back and start again, as he did. It is merely a question of whether the Air Force is best devoted to assisting the land-battle in terms of airborne forces or in terms of some other form of Air Force.

THE LECTURER: There is absolutely no question about that: you must have an Air Force. Nobody will argue about that. The Army is the greatest supporter of that. The offensive support we got was exactly what was required. As you say, it would have been very pleasant had we had more. But I do not believe that it can take the place of airborne

forces, although I suppose I am biassed. However many rocket fighters you had, you would not have stopped the Germans blowing up those bridges. The only thing that can stop a man blowing up a bridge is for another man to arrive in time actively to stop him, or to pull out the charges before somebody can blow them—which is what the United States airborne divisions actually did. Taking that particular example, I do not think we could have done it in any other way than with airborne forces and advanced as quickly as we did. I cannot give you a definite answer, as it is mainly a matter of opinion.

SQUADRON LEADER R. G. B. SUMMERS: What do you consider to be the best sort of Air Force support in a dropping zone before you actually drop your troops? You said that it is as well to choose a dropping area where tanks or heavy guns could not be used. Therefore, if the Air Force concentrated on such an area it would be a clear indication of future activity in that area. I should like to know what you think is the best sort of pre-dropping support.

THE LECTURER: It is extremely difficult to be definite about a thing which must be judged on its merits at the time, but generally I should say that the sort of support we should like best is masses and masses of fighters coming in with rockets, light bombs and cannon. Saturation bombing probably would give away where you were going to land, unless you could do it simultaneously in about six other areas, which you probably would not be able to do. In any case, however carefully you bombed you would probably ruin the landing zone for the gliders; it would not worry the parachutists so much, but it would certainly worry the gliders if the whole landing zone were a mass of even small craters. Therefore, my own view is that what we should like would be a lot of fighters coming in just ahead of the main stream and absolutely plastering everything in the area with everything they have got; at the same time the heavy artillery would be doing similar things.

There is another point about saturation bombing. I think I am right is saying that although it considerably dismayed the enemy, it killed very few and put very little enemy equipment out of action. Therefore, for it to be really valuable, your troops must come in very closely behind. I do not know whether it would be possible to do a saturation raid with bombers and then come in quickly enough and collect yourself, and get into battle in order to get the fullest advantage from that bombing raid. You must remember that it takes a parachute unit a long time, even by day, to collect itself, to rendezvous at the correct place and then start its battle as a proper formation. There would be a big time-lag, and the bombing might have been wasted, in that the enemy would have shaken their heads once or twice and come to, ready to fight again.

There is one point I should like to add. I think most airborne commanders would agree that the offensive support you lay on with your fighters has got to be very intimate; I mean, right round the edges of your dropping zone. The corollary is that you have got to be prepared to accept the odd casualty from your own fighters. I think I am right in saying that most airborne commanders would accept that risk. It is a very similar risk to that involved in following up behind artillery. In the long run you save yourself casualties by getting as close to your own artillery as possible. Even if the odd shell happens to drop a little bit short, it is well worth it in the end; although admittedly it is not worth it to the one chap who gets hit.

COMMODORE R. HARRISON, R.N.R.: I should like to take this opportunity of making a remark apart from technicalities as the name of Arnhem is very much in our minds.

During the Summer I had the privilege of visiting Arnhem and of realizing what the Dutch people think of those gallant men. I should like to place on record that from my own observation they have a very deep regard indeed for the 1st Airborne Division as is illustrated by the charming and delightful spot which has been selected for the cemetery. It is just like a little piece of English countryside, and each grave is attended to by a local Dutch family.

AIR COMMODORE L. TAYLOR: You referred at the beginning of the lecture to the potential threat of an airborne force, and later said that one thing not to do with airborne forces was to use them for the sake of using them. That seems to imply the possibility of long periods of non-use after training. That, in turn, introduces the problem of keeping them at concert pitch for a job which they do not get around to. How do you overcome that difficulty?

THE LECTURER: I think that there is a lot of truth in what you say. It may well be difficult if you have these long periods in which they have to be kept at concert pitch. There will be such things as raids which can be laid on, which may be valuable: obviously they have to be valuable or they are not worth laying on. But even the smallest raid is a great morale lifter and keeps people at concert pitch. I agree that there may be periods when the troops are sitting back waiting for something to do, and for a long time. The answer is that nobody is ever really well-trained enough, and you must train him a bit more. There is no question of doubt that even by D-day in Normandy there were a lot of divisions who had been training very hard for three years, yet I think most people in them would agree that they would not have minded having just another six months to sharpen up one or two things. I believe that exactly the same applies to airborne forces: that you will never get your training up to what you consider 100 per cent. If you make your training interesting, as you should, then I think you can keep them at concert pitch. I do agree, however, that is a problem which one has got to watch very, very carefully.

THE SECRETARY (CAPTAIN E. ALTHAM, R.N.): You have already expressed your appreciation to General Cassels for his extraordinarily interesting lecture. It only remains for me to thank him on your behalf, which I am sure you would wish me to do, for the most painstaking and able way in which he has answered the very many questions fired at him. That has greatly enhanced the value and interest of this meeting. (*Applause.*)

SOME AIR ASPECTS OF AIRBORNE ASSAULT

By "AQUILA"

THE conditions in which an airborne assault can be projected demand a high degree of air superiority. The necessity for establishing this air superiority is of such overwhelming importance that I propose to deal briefly with the problem in abstract before discussing the airborne assault phase of a particular air operation.

Broadly speaking the air situation can be divided into the general and the local air situation; indeed, we might define them as the strategic and tactical air situations. The development of general air superiority may take many months or even years, for it involves a long-drawn battle in which victory emerges slowly and the vanquished is step by step thrown on to the defensive. The main instrument in this battle is the bomber, while the fighter plays the complementary part of parrying the enemy air forces when they put to the air. Together the bomber and fighter are the punch and the guard, the sword and the shield.

When the air situation is judged to be satisfactory strategically we may consider the launching of an army on to the open continental masses beyond the security of our base areas. It may be that we can then think of supporting that army with an occasional airborne operation. But let us look first of all at the tactical air situation which we must bring about.

We have our main army in its bridgehead on the Continent. It will need local air superiority within which to conduct its operations effectively. After the airborne assault has been launched, the troops in the airborne objective will equally require air superiority. The transport force which carries the troops to their objective will also require local air superiority *en route* and in particular over the dropping zones. Air superiority in a case like this involves also the domination of the enemy's anti-aircraft weapons, for air transports are particularly vulnerable when they descend to low altitude, as they must, to drop their troops and supplies. And here we may use ground attack aircraft with which to douse the enemy's fire.

As soon as the airborne assault is launched, the army will endeavour to break out of its bridgehead to link up with the airborne troops on its line of advance. It is just at this moment that the army will require all the air support it can get to speed the break-out. But it is also at this moment that the airborne troops will require all the air support they can get, for they will be light in heavy weapons and must depend largely upon air support to compensate for these deficiencies.

Thus we see that an airborne assault implies a serious dispersion of our air resources. Fighter cover must be provided for the main army, for the airborne troops, and for the transport aircraft. The *flak* must be doused. Both the main army and the airborne troops need the greatest possible air support. Moreover, all these commitments must be fulfilled simultaneously at the most critical moment in the operations of both air and ground forces.

EXPERIENCE IN THE LATE WAR

There were slight differences in the planning procedure and staff organization for the various airborne operations during the invasion of Europe at the end of the late war. The Normandy and Arnhem operations taught us a number of lessons which were put to good effect at the final assault across the Rhine. This was called Operation VARSITY.

From the air point of view there are broadly speaking four main rules to be followed. First, an almost hackneyed but never to be forgotten lesson, there must be the closest possible liaison between the Army and the Air Force. This must amount to more than a formal spirit of co-operation. Where possible, headquarters should be joint, and the two Services should share messes together. Second, the Army formation commander should have only one Air Force commander to deal with at his level. Correspondingly, the Air formation commander should have only one Army formation commander to deal with. Thus at Army Group level, the Land Commander-in-Chief will normally have to deal with the Air Commander-in-Chief of a Tactical Air Force. And at Army level, there will normally be a Tactical Air Group. However, it is to be remembered that there may be no relationship between the proportions of the ground operations and those of the air operations ; for example, a brigade or division may precipitate an extensive air battle, as in the case of the Canadian attack on Dieppe, or vast armies may sweep across Europe—as the Russians did in the German retreat, without giving rise to more than intermittent air skirmishes. Third, the control of transport forces must be retained at the highest level, for amongst the plethora of demands for its services, it is only the Supreme Commander who can weigh the priorities and ensure that effort is not dispersed or locked up unnecessarily. Fourth, when an airborne assault is to be launched, the transport formations must be controlled by the Air Force authority who also controls the Tactical Air Forces in the command ; otherwise there is always the danger that the transports will not be properly escorted, or will operate without due regard to the air situation.

The sequence of planning for Operation VARSITY followed conventional lines. The Supreme Commander issued a directive to the Army Group/Tactical Air Force Headquarters. Here an outline plan was drawn up as the basis for detailed planning by lower formations. In fact, the Supreme Commander, who was also the highest Army Commander in the theatre, delegated the responsibility for planning to the Commander-in-Chief, 21st Army Group. He in turn delegated responsibility for detailed planning to the 2nd Army upon whose line of advance the airborne forces were to be dropped.

On the Air side, the Deputy Supreme Commander, who was also commander of all air operations in the theatre and was responsible for them to General Eisenhower in his capacity as Supreme Commander, delegated responsibility for planning to the A.O.C.-in-C., 2nd Tactical Air Force. He also made him the Air Commander of all operations in support of VARSITY. The A.O.C.-in-C., 2nd T.A.F., in his turn delegated responsibility for the planning and control of all operations in the immediate battle area to the A.O.C., 83rd Group.

As far as the airborne forces were concerned, an Allied airborne army had been formed comprising the British and United States airborne forces and the transport aircraft. For the purposes of VARSITY, the Commanding General 1st Allied Airborne Army was placed at the same level as Army Group/Tactical Air Force. His functions were planning and co-ordination rather than command. In delegating responsibility for detailed planning, he made the Commanding General of the XVIII U.S. Airborne Corps responsible for planning the ground operations of the airborne troops, and the Commanding General IX U.S. Troop Carrier Command responsible for planning the transport operations. Since the 6th British Airborne Division was being mounted in England, and the 17th U.S. Airborne Division was being mounted from continental bases, the Commanding General IX U.S. T.C.C., whose headquarters was at Paris, made a further delegation of responsibility to the

A.O.C. 38 Group. He was to be responsible for the mounting of all airborne troops in the United Kingdom.

As far as the air was concerned there were two main divisions of the plan—the transport operations and the support operations. For instance, the transport formations planned with 83 Group for the escorting and operational arrangements, and with the airborne formations for the mounting. 83 Group planned with the 2nd Army and the airborne forces for the offensive support arrangements, and with the transport formations for the air operations.

Although 83 Group controlled the supporting operations in the tactical area of the assault, there were other air forces which could be called upon for support. In fact, the Deputy Supreme Commander had intimated that all available air forces would be thrown into the battle in support of VARSITY. The A.O.C.-in-C., T.A.F., had also at call the resources of Fighter Command and of IX U.S.A.A.F. (Tactical Air Force).

Meanwhile it was possible to call in the assistance of the Strategic Air Forces. These were under the direction of the Combined Chiefs of Staff at Washington, but for the purpose of the Invasion and to simplify the channels for calling them to the support of the land campaign, the C.C.O.S. had constituted the Chief of the Air Staff (R.A.F.) and the Commanding General of the United States Air Forces in Europe as their agents in London. Thus any appeal for their assistance had to pass through the Supreme Headquarters to the agents of the C.C.O.S., in London. The forces involved were Bomber Command (R.A.F.), VIII U.S.A.A.F., Coastal Command (R.A.F.), and XV U.S.A.A.F., in Italy.

The transport forces comprised the IX U.S. T.C.C., with 1,112 aircraft, and 38 and 46 Groups of R.A.F. Transport Command with a total of 440 aircraft. Owing to the discrepancy in the strength of the British transport force, a number of U.S. aircraft of 52 Wing on the continent were detached to the U.K. to assist in lifting the 6th Airborne Division.

Thus, from the air point of view the headquarters involved in planning VARSITY were widely scattered. The 2nd Tactical Air Force was at Brussels, 83 Group at Eindhoven, IX U.S. T.C.C. at Paris and 38 Group at Earls Colne in Essex. In addition, Supreme Headquarters Allied Expeditionary Force at Rheims was intimately concerned in the detailed planning in its capacity as the channel through which the strategic air forces could be brought to bear upon the land battle. This meant that the planners had to travel far and fast in the course of assembling their plans. It was only because the weather was reasonably good throughout the planning period that no serious interruption was caused.

The supporting operations under the control of 83 Group fell into three main categories. There was the task of neutralizing the enemy air forces. This was performed by bomber attacks against the enemy airfields within range of the airborne forces objective during the few days before the assault, and throughout the assault itself fighter patrols were maintained over them Next, there was the task of neutralizing the enemy's *flak* positions in the Dz and Lz area.[1] Since the area was to be within artillery range of the 2nd Army's guns, this task was made the joint responsibility of the 2nd Army and 83 Group. The enemy had anticipated that an airborne assault might be launched against this particular sector of the front beyond Wesel, and they had concentrated a strong force of *flak* weapons around the landing

[1] Dz = Dropping Zone; Lz = Landing Zone.

zone. There were altogether about five hundred *flak* positions and the 2nd Army's guns could engage some ninety of them. It was arranged that the artillery counter-*flak* fire should be maintained until the first transport aircraft crossed the Rhine. In the air, anti-*flak* patrols were maintained throughout the operation. Nevertheless, the *flak* proved very heavy in the event, and only slackened perceptibly when the airborne troops themselves had occupied large numbers of *flak* positions. The third of the supporting tasks was the provision of offensive support for the 2nd Army breaking out across the Rhine, and for the airborne troops once they were on the ground and consolidating their objective. In addition to these tasks there was, of course, the continuing necessity for cover over the Army, the airborne troops, and the transport forces.

The Flight Plan for the transport forces had to be drawn up in detail and distributed for the information of all air, army and especially naval units, which might otherwise have been liable to open fire. The aircraft formed up from their various airfields and met at Wing and Group rendezvous. From here the streams from the United Kingdom and the Continent met at a Force Rendezvous just South of Brussels, whence they headed for the Target Rendezvous sited some thirty miles this side of the Dz and Lz area. Thus the aircraft were able to check their position and timing throughout the approach, and at the same time to keep to their exact station.

We now have the complete picture of the extensive air operations supporting this airborne assault. There was R.A.F. Bomber Command, whose aircraft attacked communications targets between Bremen and the Ruhr, so isolating the area of the airborne forces objective that the Germans had to rely almost entirely upon horse-drawn transport. There was the VIII U.S. Air Force whose bombers attacked the fighter airfields within range of the airborne objective before the assault and which provided re-supply for the airborne troops shortly after they had made their landing. At the same time their long-range fighters covered the XV U.S. Air Force heavy bombers in their diversionary attack against Berlin. There was Coastal Command whose aircraft made another diversionary attack against Borkum. There was the XV U.S. Air Force whose heavy bombers attacked Berlin from their bases in Italy. There was Fighter Command whose aircraft escorted the stream of transport aircraft from England to the Force Rendezvous. There was the IX U.S. Tactical Air Force whose aircraft escorted the transport aircraft from their continental bases to the Force Rendezvous. And finally there was 83 Group with all the resources of the 2nd Tactical Air Force covering the air and ground forces in the battle area, patrolling the airfields, attacking the *flak* positions and providing the offensive support so urgently needed by the Army in the critical phases of the land battle.

How was the necessary advice given to the Commander-in-Chief 21st Army Group that all was ready to set in motion all these operations spreading across the whole map of Europe? The main factors affecting the final order were the air situation of course, the weather, the preparedness of the air forces and the tactical situation on the battlefield. Thus, it was the A.O.C.-in-C., 2nd T.A.F., who was perhaps most concerned in giving this final advice. Accordingly, the Commanding General 1st Allied Airborne Army established a Command Post alongside 2nd T.A.F., at Brussels. Here he was in telephonic communication with the IX U.S. T.C.C. and within easy reach of the C.-in-C., 21st Army Group. The planning had started on 10th February, and on 24th March the commanders of the air and army formations were able to advise the C.-in-C., 21st Army Group, that all was ready and that conditions were favourable for the operation. Thereupon, the order was given to launch the assault.

There were over 7,000 aircraft of all types engaged in the Operation, and of these less than 3,000 were transports and gliders. During the first day of the assault some 15,000 sorties were flown in support of the Operation, all designed to draw off or destroy the enemy's air defences and to deliver the two airborne divisions to their appointed landing zones beyond the Rhine.

Conclusions

This form of airborne assault, which might in other circumstances have been followed up by air-transported operations, is restricted by two main considerations. First, the air situation must be almost entirely favourable, and to achieve such a state of affairs many months and years of war may be necessary. In the future, it is equally clear that the strategic use of airborne forces might be countered by atomic weapons, should their mission appear sufficiently dangerous to the enemy's position. Thus it may be safely said that the development of such an air situation and the exhaustion of the enemy's stock of atomic bombs will be conditions for the strategic use of such operations. Secondly, airborne assaults are limited by the capacity of aircraft. We look forward immediately to aircraft which will carry some eleven tons, and the Americans have aircraft which carry twenty tons. They look forward to producing aircraft to carry fifty tons in the not so distant future, and have been thinking in terms of lifts up to one hundred and one hundred and fifty tons. When we think that the Berlin airlift is already supplying the equivalent of between fifteen and twenty divisions, it is not difficult to conjure up pictures of armies projected deep into the heart of continents relying entirely upon air supply. Is it too fantastic to visualize a series of giant hedgehogs advancing like pawns across the map of some continental enemy—a mobile system of fortresses reminiscent of the fortress war of Marlborough's time? When one fortress got into difficulties, we could concentrate our transport forces and reinforce it until it was strong enough to break the enemy. When another was attacked by superior numbers, we could concentrate the great striking power of our air forces and shatter the enemy hordes, and perhaps place another fortress across his lines of communication. When yet another fortress was heavily attacked we might have to evacuate it, but this would certainly be an operation to be studied, not as an admission of defeat, but as a deft tactical manoeuvre.

But whatever schemes we may devise in such warfare, the one dominating factor will always be that we must establish and retain command of the air ocean. For only by this means can we ensure that at all times we enjoy freedom of action to further our strategic designs, and conversely deny to the enemy his ability to thwart our plans.

SEA AND AIR POWER

SOME FURTHER CONSIDERATIONS

By Admiral Sir Gerald Dickens, K.C.V.O., C.B., C.M.G.

IN writing his article on "Sea and Air Power" for last quarter's Journal, Mr. Spaight has performed a valuable service. As he says, the fog surrounding the subject needs clearing away and those who have read his treatise will surely agree that it has helped them to weigh up the factors involved and their relative values. He will, no doubt, agree that his answer to the problem may not in every respect be final, that certain of his contentions are open to argument and that some critical comments may help still further in dissipating the fog.

Mr. Spaight lays down clearly, succinctly and correctly what sea power is, yet, when he examines the functions of the armed forces in achieving and maintaining it, he sometimes departs from his original formula. For instance he says, "The truth is that the definitions do not correspond with the reality. They separate the sea and the air too precisely and therefore give the wrong impression. One would not gather from them that sea power goes up and uses the air space on occasion, or that air power goes down and meddles with shipping." This is all the more curious as in the immediately preceding paragraphs he has been careful to define air and sea forces as *instruments* of sea power—which is precisely what they are; for, of course, sea power does not go up into the sky, sea power being an amalgam of the armed forces involved, the Merchant Navy and the bases. Both the latter remain in their own element. Now this is a particularly weighty consideration, seeing that the Merchant Navy is not only a very important part of sea power but is, I would suggest, the very foundation of that power. The bases are also of vital importance and the mention of them reminds one of the very considerable part played by the land forces in the exercise of sea power; and yet there has never been any question of trying to define land power in its relation to sea power, or of coining such spurious currency in expressions as "sea/land power." Here, it seems, is the real answer to the problem: to give up attempting to define the status and relative importance of the forces contributing to sea, air or land power. Even the broadest definition will always be unsatisfactory and will only give us unnecessary headaches. Cannot one go further than this and suggest that not only is the air an instrument of sea power, but that in this connotation air power does not quite carry with it the wider and fuller significance possessed by sea power whatever comprehensive significance may be, and is, implicit in air power in other connections?

For what is sea power? It is the power, in whatever way it may be achieved, to safeguard our *sea* lines of communications on which the existence of our peoples ultimately depends and the ability of all our forces in Great Britain and other countries of the Commonwealth to fight. We need not here go into the other attributes of sea power though we may remind ourselves that we cannot invade any enemy country with *all* our forces in combination unless we do so from the sea.

Seeing then what the sea means to us—our life-blood, our wealth, the only medium by which food, raw materials (including oil and petrol) can reach us, and that it is the main channel by which the forces of the Commonwealth may be concentrated and maintained wherever they go—would it be too much to say that the expression sea power would still be a perfectly logical one if the air weapon alone could give us command at sea?

The futile itch for definition and precise classification would be less insistent were we less inclined to imagine that the use of certain weapons is necessarily the prerogative of one particular Service. The naval aircraft, for instance, is now as much a naval weapon as the gun. In the early days of artillery ship's guns were fought by soldiers, and when in course of time this duty was taken over by the mariner, old soldiers, no doubt, considered this an unwarrantable encroachment. There are possibly airmen to-day who feel some irritation at the Navy poaching on their preserves and sailors who are quite indignant that air rescue craft do not fly the White Ensign! We must obviously cut out such childish, or senile, conservatism.

Then, too, the parts to be played by the three Services in gaining and maintaining sea power call for no definitions. The Navy's part is, of course, constant and calls for its whole strength. As regards the Army and the Royal Air Force, their shares will depend on the nature of the war and the manner and degree of the threat to our sea communications, and so the effort demanded of them will vary. But even at its least it must be very considerable. For our enemies know, as they have always known, how vulnerable we are at sea, what a tremendous undertaking confronts us, even when we are at our strongest, in affording adequate protection for our trade and transports, spread out as they are all over the seas and oceans of the World. They know that it is but a step from the sea being a tower of strength to us to its being our Achilles heel. The Army's and R.A.F's tasks in the exercise of sea power may, therefore, at times demand the greater part of their strength. Many is the time in the past when the major land campaigns in a war have been fought purely and simply to strengthen our sea power. For what purpose did we, in the late war, commit ourselves to those vast military operations in northern and eastern Africa? Surely it was to give us mastery of the Mediterranean and Red Seas.

If our strategy is sound there will be no difficulty in assessing the contributions of the armed forces needed for the maintenance of sea power. But our strategy can only be sound if those who shape it continually keep before them the fact of our dependence on the sea. Yet, strangely, on all too many occasions in the past, not to say the recent past, this clear-cut fact has somehow become blurred in the minds of our leaders, and maritime essentials have been allowed to suffer because we dreamed of continental exploits before sea power had been assured. The price we have invariably paid when we have given our maritime commitments a secondary place has always been a big one. So will it be if we again err in this way.

SEA RAIDERS IN THE 1939-45 WAR

By COMMANDER E. V. ST. J. MORGAN, D.S.C., R.N.

On Wednesday, 24th November, 1948

VICE-ADMIRAL Sir CECIL HARCOURT, K.C.B., C.B.E., in the Chair

THE CHAIRMAN: Commander Morgan, who is going to give this lecture, is one of the instructors at the Staff College and it was there that it was first produced. I think I am right in saying this is the first review of the subject that has been made; it is the first I have seen of this particular aspect of the recent war.

LECTURE

I PROPOSE to deal with the subject of this lecture year by year giving, first, the general strategic background of each year, followed by the activities of the warship raiders, and then those of the converted merchant ships which I shall call auxiliary cruisers. My aim is to demonstrate the effect the surface raiders had on the war at sea as a whole, but I should like you to bear in mind all the time that the surface raider, to-day, is only one arm in a war against commerce, and its achievements must therefore be reviewed in conjunction with those other arms, above and below the sea.

Now the aim of commerce warfare is to destroy the enemy's shipping, or so disorganize it that the restriction on his trade becomes unbearable. The surface raider can assist this in three ways:—

(*a*) By sinking ships.

(*b*) By disorganizing trade by fear of her presence, by mine-laying, etc.

(*c*) By dispersing the enemy's armed forces so that other units—submarines, aircraft, etc., may have a better chance of destroying that trade.

It is against these three factors, and not against sinkings alone, that we must judge its success or failure in war.

GERMAN PREPARATIONS FOR COMMERCE WARFARE

As a result of Admiral Raeder's researches into the results of the 1914–18 War, he came to the following conclusions on the subject of commerce warfare:—

(*a*) That the warship cruiser, constructed for normal fleet work, was unsuitable for commerce warfare by a country without overseas bases.

(*b*) That converted liners, as used at the beginning of that war, were too conspicuous and uneconomical.

(*c*) That independence and deception were more useful qualities in a raider than speed and gun power.

The result of these conclusions was that Germany set out to re-equip her Navy for commerce raiding, and constructed the three pocket battleships. In addition, the 1934 estimates allowed for the construction of four auxiliary cruisers—the programme was limited to this number as only 24 guns were made available by the Army—but nothing had been done about them when the War started; fortunately for us priority for the German Navy was low.

A further result of the previous war's experience was the reconstitution of the Etappe organization. The first move to re-establish it was made as early as 1927; but nothing concrete was done until 1930. This supply and information organization

was designed to overcome the lack of foreign possessions and bases, and made use of agents all over the World—but particularly in countries likely to remain neutral in war.

The "Z" Plan

After Hitler came to power Admiral Raeder was given the task of building up the German Navy. His programme, which was known to the Germans as "The 'Z' Plan," was due to be completed by 1944, before which date Hitler had promised that there would be no war. The "Z" Plan provided for the following :—

3 fast battleships,
3 converted pocket battleships,
5 heavy cruisers,
Several minelaying and scouting cruisers,
2 aircraft carriers,
190 submarines,
and an unspecified number of auxiliary cruisers.

These ships were to operate in two groups, each consisting of three of the heaviest type Diesel-powered battleships, equipped with 40 cm. (16 in.) guns, and would have the task of intercepting and destroying the heavy British forces, necessarily dispersed, which would pursue the German units engaged in commerce warfare. In addition to the above, the "Scharnhorst," "Gneisenau," "Tirpitz" and "Bismarck" would remain in home waters to hold down as many of the British heavy ships as possible.

As things turned out, we were spared the grave dangers such a force would have constituted for, when war came in 1939, the German Navy was a mere shadow of Raeder's dream. It consisted of three pocket battleships, one of which was doing a long refit, and the "Scharnhorst" and "Gneisenau," neither of which was ready to operate ; no auxiliary cruisers had yet been constructed or converted.

Of the two units ready, the "Graf Spee" sailed on 21st August, 1939, for her war station in mid-Atlantic, and the "Deutschland" followed her on the 24th August, for the North Atlantic. Two supply ships were also on their stations when war was declared.

Although the German Admiralty had sent their two available commerce raiders to sea before war was declared, Hitler decided not to employ them at once as he still clung to the hope that, with the collapse of Poland, the Allies would call the war off. He lifted the ban, so far as British ships were concerned, at the end of September ; but French ships were still forbidden targets as the Fuehrer hoped to divide France and England. All action was to be strictly in accordance with Prize Law so as not to alienate American sympathies. This leniency towards French ships was particularly resented by the German Admiralty in regard to the "Strasburg" and "Dunkerque," which were specially built to hunt the pocket battleships. By mid-October, however, the German Navy had got their way, and attacks were permitted against all French ships ; but we had been given six valuable weeks respite.

ALLIED DISPOSITIONS AND COUNTER-MEASURES

On the outbreak of war the British policy was to defend our trade routes by cruisers patrolling the focal area and to rely on evasive routing in the outer oceans. When, however, definite news was received that a powerful raider was out, more active steps had to be taken.

Some inkling of German movements reached our ears on 24th August, 1939, and on the 26th the Admiralty issued orders that the Northern Patrol was to start as soon as possible, but the enemy ships had already passed. By 3rd September, the Admiralty considered that the movements had been to escort the "Bremen" home and a week later dispositions were made assuming none of the German ships were at sea. It was not until 1st October, that we had definite information that a German raider was at large, when news was received from the "Graf Spee's" first victim. Hunting groups were then instituted to seek out the enemy. These groups were further augmented on 31st October, and were at that date as follows:—

Title	*Ships comprising Unit*	*Station*
Force F	"Berwick" and "York"	N. America and West Indies.
Force G	Two out of "Cumberland," "Exeter," "Ajax," "Achilles."	E. of South America.
Force H	"Sussex" and "Shropshire"... ...	S. Africa, West Coast.
Force I	"Cornwall," "Dorsetshire," "Eagle"	Colombo.
Force J	"Malaya," "Glorious"	Aden area.
Force K	"Ark Royal," "Renown," "Neptune"	Freetown.
Force L	"Furious," "Repulse"	N. Atlantic.
Force X	1st Division French 8 in. cruisers ...	Pernambuco to Sierra Leone.
Force Y	"Strasburg," "Hermes"	ditto.

In addition, several capital ships and cruisers were employed on the Atlantic convoy routes. This accounted for a very large proportion of the British Fleet, and with the attitude of Italy and Japan still uncertain, the Germans had achieved a high degree of dispersion of our forces in return for their outlay of two pocket battleships. After the sinking of the "Graf Spee" these hunting groups were dispersed, but similar measures were taken whenever a warship was known to be out on the trade routes.

Further measures were the taking up of 25 ships at the end of August for conversion to armed merchant cruisers, and by October some 50 were fitting out. About half were destined for the Northern Patrol and the remainder for trade protection.

RAIDERS IN 1939

Fate of the "Graf Spee"

Now for the ships themselves. The "Graf Spee," after leaving Wilhelmshaven on 21st August, 1939, passed through the Faroes-Iceland passage and proceeded South. Her first victim was the British s.s. "Clement," which she sank off the coast of Brazil on 30th September. The crew, which was picked up and reached shore on 1st October, brought the first news of her whereabouts; though she was reported to be the "Admiral Scheer." During October, the raider sank a further five ships in the South Atlantic and then, at the end of the month, she proceeded to the Indian Ocean, claiming her only victim in this area on 15th November, in the North Mozambique Channel. She then returned to the South Atlantic, and while on passage met and sank the "Doric Star" on the Cape—Sierra Leone route. This ship managed to get off a raider report and, as a result of this, Commodore Harwood, commanding the South Atlantic Squadron, divining the raider's intention to proceed to the River Plate area, ordered his Squadron to concentrate 150 miles off the river entrance.

Meanwhile, the " Graf Spee " sank a further two ships and fuelled for the last time from the " Altmark " on 6th December.

The story is well known of the destruction of this German ship, whose qualities had exercised naval minds for many years—built to outfight any ship fast enough to catch her and to outdistance one strong enough to sink her. This was not only a great tactical victory but a great moral one as well ; it shook Hitler's confidence in the German Navy and he never wholly regained it. I believe that this shaken confidence in his Navy was an important factor in causing Hitler's postponements of the invasion of this Country in the following Summer.

In her short career the " Graf Spee " had sunk nine ships, totalling 50,000 tons ; but it is partly to her credit that it was done without the loss of a single life.

Cruise of the " Deutschland "

Meanwhile the " Deutschland " was having even less success. She sailed from Germany on 24th August, for her war station in the North Atlantic, but her inactivity, as a result of Hitler's restrictive order, led to the belief that she had sailed much later ; in fact we were ignorant of her whereabouts until two months after she sailed.

On 5th October, she claimed her first victim, and four days later she intercepted the U.S. ship " City of Flint," which she sent in prize to Germany with prisoners on board. This capture of a neutral vessel and infringement of Norwegian territorial waters led to strong diplomatic action between the four countries concerned, with the result that the ship and British prisoners were released. On 14th October, she sank one more ship. She was recalled on 1st November, and arrived at Kiel on the 15th.

Her short cruise had netted only two ships of 7,000 tons total tonnage—and a nasty look from the Americans.

GERMAN POLICY IN 1940

We now enter the year 1940. As a result of the two pocket battleship cruises, the German Naval Command realized that these ships were not as successful as commerce raiders as they had hoped ; also that the route through the Arctic and Atlantic was becoming dangerous. Negotiations were therefore started to obtain the use of Russian and Italian ports to fit out auxiliary cruisers—the German yards being full with submarine work. The Russians were asked for a port in the Murmansk area and for permission and assistance to pass ships out through the northern route to the Pacific. Though the latter was obtained, it was only made use of on one occasion.

The outlook at the beginning of 1940, as the German Naval Staff saw it, was that conditions at sea were generally favourable for commerce warfare, and that auxiliary cruisers could materially assist, not so much by sinking merchant ships as by disturbing British merchant shipping and by diverting strong defence forces overseas. However, Admiral Raeder felt compelled to warn Hitler that, with Germany's present force, cruiser warfare with pocket battleships, even assisted by auxiliary cruisers, was doomed eventually to failure unless Germany had sufficient heavy ships to hold down the major portion of the British Fleet in home waters and to be able to challenge our strength in the North Atlantic.

The raider activity which the German staff had hoped to launch during this year met with several difficulties. First, the ships were required for the Norwegian campaign ; the " Scheer's " refit took longer than anticipated ; then, in June, the " Scharnhorst " was torpedoed by the " Acasta," and the " Gneisenau " by the

submarine " Clyde " These casualties prevented the exploitation of the strategic position afforded by the fall of France.

By February, 1940, the British Admiralty had decided that battleships were, as far as possible, to escort large or valuable Atlantic convoys ; cruisers or A.M.C's were to be attached to less important convoys.

The fall of France in the Summer of that year and the despatch of reinforcements to the Middle East stretched our resources almost to breaking point. Our policy had to be modified and was directed to affording reasonable security for troop convoys, a lesser degree to trade convoys, supplemented by a covering force, and the provision of hunting groups on a minimum scale in the more important focal areas. The provision of hunting groups in the North Atlantic was assigned to the Home Fleet and to Force " H " in the Azores area. This left only two carriers and five cruisers for the rest of the North and South Atlantic, and troop convoys all over the World had to be defended by a total force of one " Revenge " class battleship, eight cruisers and one armed merchant cruiser. The residue of one more " Revenge " class battleship and a handful of A.M.C's had to do their best with all the trade convoys.

The " Scheer's " Cruise

The " Admiral Scheer " left the port of Gotenhaven on 23rd October, 1940, and proceeded via Norwegian waters and the Denmark Straits into the Atlantic. Assisted by poor visibility, she made her break-out unobserved.

Her aim was to intercept and destroy one of our lightly guarded convoys sailing from Halifax to England. She was kept informed of the date of sailing and speed of advance of these convoys, but the route was not known precisely. By 3rd November, the " Scheer " had reached her operational area ; but owing to the bad weather was unable to use her aircraft. This caused her Captain to write a long report on the impracticability of the task of a raider captain in intercepting a convoy when he has no air reconnaissance.

However, on 5th November, the weather had improved and with the aid of her aircraft the " Scheer " fell in with and sank the s.s. " Mopan." It was unfortunate that the " Mopan " was unable to get off a raider report, for that evening contact was made with Convoy HX84, consisting of 37 ships escorted only by the A.M.C. " Jervis Bay." The epic of the " Jervis Bay " needs no re-telling ; but by her gallant action 32 of the convoy were saved. The log of the " Scheer " testifies to the good use of smoke made by the ships when scattering. Another interesting point is that, in this action, the raider expended one-third of her main armament and half of her secondary armament ammunition, and so would have been seriously embarrassed if she had been brought to action.

In the subsequent hunt our dispositions were made on the assumption that the raider would make for a French port, and efforts on our part to bring her to action were unavailing and convoys had to be diverted or postponed. The result was that the entire Atlantic convoy system was disorganized for twelve days, and no convoy arrived in Britain for a whole week. Although the ships eventually reached their destinations, valuable shipping space and time were lost and great confusion caused. Hunting groups, similar to those organized for searching for the " Graf Spee," were sent out, but after five weeks of fruitless searching were dispersed to their normal functions.

After the attack on the convoy the " Scheer " proceeded to the area South-West of the Azores. After re-storing and ammunitioning she continued her depredations,

but as she was operating in an area adjacent to a U-boat we attributed her successes to the latter. Then, in January, 1941, she transferred her attention to the Indian Ocean, claiming only two victims en route. In the Indian Ocean she had four quick successes but was interrupted by being sighted by the " Glasgow's " aircraft. At that time we had several important troop and other convoys in the Indian Ocean, also total naval forces of one carrier, six heavy cruisers, and four light cruisers, but with the exception of the " Glasgow " they were far away. She managed to evade the chase but did no more damage, and returned to Germany on 1st April, 1941.

Her cruise had lasfed 161 days, during which time she had been maintained by her crew ; the only spares required were crystals for her radar, which were sent out by U-boat. Repairs included overhauls of all four main engines and underwater welding of some damage aft. Fuel and provisions were provided by supply ships and several rendezvous were made with auxiliary cruisers to discuss and arrange operations.

Contact was made with four of the auxiliary cruisers, and at one period a force of five ships—two raiders, two supply ships and one prize, cruised together for a fortnight—probably the largest concentration of German ships to cruise the outer oceans during the War. All these meetings were arranged by W/T which was used with surprising freedom. Great use was made of the area South of St. Helena for fuelling, as this was found to be generally calm. Her operational endurance for such work including periods of high speed for attack, periods stopped whilst replenishing, etc., worked out at 12,000 miles with 10 per cent. of fuel remaining. This was 2½ times as great as their steam-driven 8 in. cruisers. Her bag was sixteen ships totalling 99,000 tons.

The " Hipper's " First Cruise

Another warship raider to put to sea in 1940 was the " Hipper." She left the Elbe on 30th November, and broke through the Denmark Straits unseen. She met with continuous bad weather which seriously interfered with her refuelling arrangements. It was found that her endurance was so low that she was compelled to remain within 600 miles of a supply ship. However, on 22nd December, she managed to get off her aircraft to search for Force H which had left Gibraltar for the Azores area. On Christmas Eve, she made contact with a southbound troop convoy 700 miles West of Finisterre. She shadowed during the night in very poor visibility and our forces do not seem to have been aware of her presence until the next day. The raider was unaware of the strength of the escort which comprised three cruisers, two carriers and two corvettes. She attacked with torpedoes during the night but all missed. On closing to attack the next day, she was surprised to find herself confronted by two cruisers, the " Berwick " and " Bonaventure," which after a short action in very bad visibility drove her off and lost her. The " Hipper " received slight damage and with her machinery defects decided to make for Brest, where she arrived on 27th December—the first German heavy ship to make use of a captured French port.

The Auxiliary Cruisers Put to Sea

1940 saw the auxiliary cruisers at sea. The first left Germany in April, and by the Summer five had passed into the Atlantic, whilst a sixth—Raider B, made the outward passage North about Russia. In December, Raiders A and B met and carried out a combined operation, sinking five ships off Nauru Island in the Pacific. The two Captains had intended to make a landing on the island, but this project had to be abandoned on account of bad weather.

Of these six raiders, only one was brought to action; that was Raider E, which was engaged by the A.M.C. "Alcantara" in July, and again later in the year by the A.M.C. "Carnarvon Castle," but on both occasions the raider was able to escape owing to her superior speed and gun power. Between them, these six raiders accounted for 56 ships of 374,000 tons during the year.

GERMAN POLICY IN 1941

The threat to British shipping during 1941 continued to be serious. In February of that year there were two battle cruisers, one pocket battleship, one 8 in. cruiser, and six auxiliary cruisers simultaneously at sea ravaging our commerce. Germany knew well that the risks of a contested invasion need not be faced if, by the interruption of sea-borne supplies, Britain could be cut off from her sources of food and war materials. This end was believed to be within the power of the German raiders, submarines and aircraft. Greater facilities were open to them by the possession of the ports and bases in Norway, the Low Countries and France; powerful new ships, such as the "Bismarck," were nearing completion and would soon be able to reinforce the onslaught on shipping.

By the Spring of this year the Americans, though still neutral, had pushed their warship patrols as far as 38° West, and by following and reporting were being a serious embarrassment to the German ships. Admiral Raeder, realizing that the extinction of his supply ships would put an end to commerce destruction, pressed again and again for the capture of Dakar and the use of Spanish ports. "Decisive offensive warfare against merchant ships is the only way to conquer Britain," he insisted. "German surface forces may gradually be destroyed, but this must not prevent them from operating against shipping."

However, it was not only lack of warships or bases which stayed the enemy's hand; by November, 1941, the oil situation had become serious, and by December it was critical, as practically all imports from Rumania had stopped. Further Atlantic operations were impossible until the situation improved.

To return to the ships. The "Hipper" left Brest after repairs on 1st February, 1941. On the 12th she fell in with a Sierra Leone slow convoy of 19 unescorted ships 200 miles East of the Azores. She sank seven of these. After this she developed engine trouble, and being still worried about replenishments of fuel and ammunition in the bad weather, she decided to return again to Brest, where she arrived on the 14th. Her total of eight ships amounted to 34,000 tons.

Cruise of the "Scharnhorst" and "Gneisenau"

On 23rd January, 1941, the "Scharnhorst" and "Gneisenau" were sighted by agents passing Nyborg, in the Great Belt, and this information reached the Admiralty on the 25th; but aided by bad weather and fighter sweeps, they escaped our air patrols and proceeded unmolested towards the Denmark Straits. At daybreak on the 28th, they sighted two cruisers and gained radar contact on what was estimated to be a flotilla of destroyers. This was in fact the van of the Home Fleet which had put to sea on receipt of the intelligence report. The two German ships immediately turned away withholding their fire. One of the German ships was sighted by the "Naiad" which gave chase; but the enemy succeeded in escaping to the eastward in very bad visibility. The battle cruiser "Renown" and a flotilla of destroyers were sent to support the cruisers, but contact was never regained. Our force had consisted of three capital ships, eight cruisers and eleven destroyers. On this occasion

the German radar had proved superior to ours, and the weather conditions had been in their favour.

On 30th January, the two enemy ships refuelled near Jan Meyen Island and skirting the pack ice, passed through the Denmark Straits on 3rd February. Air reconnaissance of Scapa on 2nd February reported that the Fleet had returned. On the 8th they contacted a convoy on the Halifax route which they were about to attack, but broke away on sighting the escort, H.M.S. " Ramillies." The " Ramillies " sighted one of them which she took to be the " Hipper," who was, in fact, far away to the South at this time. This incorrect report fitted in well with the German plan as the aim was for the two battle cruisers to appear on the Halifax route and for the " Hipper " to make a simultaneous appearance on the Sierra Leone route and so, by successive appearances by heavy ships on widely dispersed main trade routes, to disrupt our convoy system. This plan miscarried as the German command failed to keep the two forces informed of the other's movements—a vital matter in a co-ordinated operation. Between the 21st and 23rd the " Scharnhorst " and " Gneisenau " met and sank five ships 500 miles off St. Johns, Newfoundland, then proceeded South as the convoys on the North Atlantic routes were too well escorted.

On 7th March, when 350 miles East of Cape Verde Islands, the " Scharnhorst " sighted a ship right ahead which was identified as the battleship " Malaya." Forbidden to attack by his instructions, the German Admiral shadowed the convoy of 54 ships which the " Malaya " and two destroyers were escorting. Three U-boats which were in the area were homed on to the convoy and five ships were sunk by them. The battle cruisers which had withdrawn during this attack closed again shortly after mid-day on the 8th and were sighted by the escort. The " Malaya " moved out to meet them but they withdrew, and the convoy proceeded without further loss. The raiders then turned North intending to harry the Halifax route again, but on 15th March, they met a number of ships which had just dispersed from convoy ; between them they sank 16 of these ships. They were sighted by the " Rodney " on the 16th whilst picking up survivors from the sunken ships, and on the 20th by aircraft from Force H, and were again sighted by shore-based aircraft on the 21st, but were able to gain the harbour of Brest unmolested on the following day. Altogether the two raiders sank 22 ships of 115,000 tons. As a result of this cruise Admiral Lütjens estimated that these ships had an endurance, for commerce raiding, of 3–4 months from the machinery and personnel point of view.

The Fate of the " Bismarck "

Spurred on by the successes of early 1941, the German Naval Command decided to launch a great onslaught against our shipping. Consequently in May, Admiral Lütjens, who had commanded the " Scharnhorst " and " Gneisenau," was despatched with the " Bismarck " and " Prinz Eugen " to harry our trade. The cruise of the battle cruisers had been cut short to try and get them ready again to operate with the " Bismarck," but defects to machinery made this impossible. The " Bismarck " was brought to action and sunk by units of the Home Fleet on 27th May, the " Prinz Eugen " escaping to Brest. Hitler was unwilling to face such losses, and refused to commit his major forces again unless he could feel certain that Britain was on the point of collapse.

About this time we had a very successful venture which relieved the pressure on our trade considerably, and it is a good example of team work. At 2.50 a.m. on 11th June, 1941, H.Q. Coastal Command was informed by the Admiralty that Intelligence

indicated the movement of an enemy major unit from the Baltic to the West coast of Norway. The full scheme of break-out patrols was put in train and the Home Fleet proceeded to a position to intercept. At 12.45 p.m. information was received from agents that the pocket battleship " Lützow "[1] had passed the Skaw ; the coastwise patrols were intensified. By 10.0 p.m. there was still no report of an air sighting, so the A.O. C.-in-C. Coastal Command decided to send out his strike force in two prongs which, on reaching the Norwegian coast would turn inwards and attack if the " Lützow " was sighted. This bold stroke succeeded and the " Lützow " and five destroyers were sighted at 2.15 a.m. on the 13th, and attacked. The pocket battleship was hit aft by a torpedo from No. 42 Beaufort Squadron and, though she got back to Kiel the next day, she was out of action for six months.

This was the last attempt of a German warship to prey on our trade routes. In spite of our world-wide commitments, the strategic position afforded the Germans by possessing bases in Norway and France, and the advantage of surprise which the attacker has, during six years of war only three of our convoys were molested and none received really heavy casualties. This, I think, shows that the Admiralty's dispositions of our limited forces, particularly the use of the old " Revenge " class battleships to cover so many convoys, were sound and effective.

Auxiliary Cruisers in 1941

During the early part of 1941 there were six German and one Italian auxiliary cruisers at large ; of these, two German and the Italian were in the Indian Ocean, two in the Atlantic and two in the Pacific. The chief success went to the notorious Captain Rogge working in the Seychelles area, but were ended by the " Leander " and " Canberra " sinking his supply ship. About this time Raider F made a lucky haul in the Antarctic when she captured a Norwegian whale factory ship and eleven whalers. In February we had our first success when the " Leander " sank the only Italian auxiliary cruiser " Ramb I," 250 miles W.S.W. of the Maldives. The state of efficiency and discipline showed clearly that the Italians were not suited to this form of warfare.

In May, the " Cornwall " found Raider F in the Seychelles area and sank her. This success was followed by another later in the year when the " Devonshire " tracked down Captain Rogge in Raider C in the South Atlantic. Survivors could not be recovered as U-boats were suspected of being in the vicinity ; this proved to be true and Captain Rogge and 300 survivors were recovered by U-boats and returned to Germany.

However, we did not have things all our own way, as an action earlier in the same month of November between the cruiser " Sydney " and Raider G had resulted in the loss of both ships.

In connection with this incident, it is of interest to compare two actions against enemy raiders which occurred within a few days of one another but had very different results. On 19th November, 1941, H.M.A.S. " Sydney " was returning to Fremantle when in the afternoon a ship was sighted which she closed to investigate. The " Sydney " called up the stranger by light, which the latter purposely refrained from answering, but when ordered to hoist her signal letters, hoisted those of the " Straat Malacca " on the blind side and foul. The Dutch flag completed the disguise. The cruiser, still signalling, approached to within 1,000 yards on the raider's port quarter, and the raider still hoping to get away with it, started making " QQQ " messages to Perth radio. Next the " Sydney " ordered the raider to hoist his secret call sign.

[1] Formerly " Deutschland."

The German ship, realizing that the game was up, opened fire with all her guns; the "Sydney" was then about 1,000 yards off, steaming on a parallel course, slightly abaft the beam—a perfect torpedo target. The raider's first full salvo scored hits on the bridge and control tower. Soon the "Sydney's" "A" turret was put out of action, the roof of "B" turret blown off, and her aircraft smashed. Torpedoes crossed the "Sydney's" track with the ninth salvo—one crossed ahead but the second hit under "A" turret. The raider was only hit four times, but this proved fatal.

Three days later, on 22nd November, in the South Atlantic, aircraft from the cruiser "Devonshire," while on patrol, reported a ship which, from the description, Captain Oliver thought might well be a raider. The aircraft was despatched to identify the unknown vessel. The suspect was closed and the "Devonshire" manoeuvred at 26 knots and kept at a range of 12,000 to 18,000 yards to avoid torpedo attack. The suspect started making "RRR" from the "Polyphemus"—a ship which she closely resembled and which could have been in the area. However, the "Polyphemus" was a ship with a counter stern, and in reply to an enquiry the aircraft answered that this ship had a cruiser stern. To make absolutely certain, the C.-in-C. S.A. was asked if this could be the "Polyphemus," and on getting a negative reply, fire was opened at 17,000 yards. Identification had been greatly assisted by a picture of the raider "Atlantis" in the American periodical *Life*. I quote these two examples solely with the object of showing that extreme care and circumspection is necessary in this type of warfare.

The sinkings for 1941 by auxiliary cruisers were 44 ships of 227,000 tons, and a further 38 ships of 194,000 tons by warships.

GERMAN POLICY, 1942 TO THE END OF THE WAR

In 1942, Hitler, against the advice of his Naval Staff, became convinced that we were going to make an attack in Norway which would allow our fleet entry into the Baltic. This he considered would, if successful, decide the issue of the War; therefore he refused to risk his heavy ships again except in northern waters. To this end, and against the advice of Admiral Raeder, he ordered the "Scharnhorst" and "Gneisenau" to break through the Straits of Dover to reach a German port. Regrettable as the success of this break through was in many ways, the removal of these ships from Atlantic ports greatly relieved the threat to our trade. Throughout that year, Admiral Raeder fought a losing battle in the councils of the O.K.W.[2]: first it was the protection of Norway, then lack of oil again; manpower was diverted to the Army to make up for losses on the Eastern front; lack of a naval air reconnaissance force to assist the break through—all contributed to his difficulties. The final blow came when the "Lützow" and "Hipper" made an abortive attempt to attack Captain Sherbrooke's convoy off the North Cape, in December, 1942, and were beaten off by his five destroyers. This was fatal to Admiral Raeder's policy of surface commerce warfare. Hitler, in a tirade which lasted uninterrupted for an hour and a half, damned Raeder, threw his policy to the winds and finally ordered all the major units to be paid off, and the guns used for A.A. and coast defence purposes. "Herr Gross-Admiral," shouted Hitler, "this day will in time acquire historical importance. I shall be the first to place big ships out of commission, and all other countries will follow me when they have seen that such ships are useless, because their day is over." Raeder was dismissed. Not many months later, his successor—Doenitz, of all people, was seeking Hitler's approval to fit out the heavy ships again.

[2] Ober Kommando Wehrmacht.

Auxiliary Cruisers in 1942

Our successes at the end of 1941 had almost cleared the oceans; and for the first two months of 1942 there was only one raider at large. In early March, H.M.S. "Durban" and the next day the A.M.C. "Cheshire" interrogated, but allowed to pass, a suspicious ship on passage South of the Cape. Investigation of this incident brought out the fact that our ships had not sufficient Intelligence information to enable them to penetrate a raider's disguise. A system was instituted which developed later into the "Checkmate system" which enabled ships to establish quickly by signal from a shore plot whether a ship was genuinely the one she said she was.

By May, 1942, there were three raiders at sea, each taking a steady toll; but their days were already numbered. In September, one of these—Raider J, attacked the U.S. ship "Stephen Hopkins," who replied with her single 4 in. gun to such effect that the raider caught fire; both ships subsequently sank. In October, what was described as an important ship was attacked and sunk by British destroyers in the English Channel whilst being escorted by four torpedo boats; this was subsequently found to be Raider B leaving for a second cruise. The Germans had been passing their outward bound raiders by this route since 1941.

The expected menace from Japanese auxiliary cruisers in the Indian Ocean did not materialize to any great extent. So far as is known, there were only two sorties by Japanese raiders in 1942. The first was made by ships which worked in company throughout; but neither these nor the two which made the second cruise had any great success. Japanese shipping problems were too acute to be able to spare ships for this sort of work. One of the Japanese raiders was sunk by H.M.I.S. "Bengal" in November, 1942, in a gallant action between the Indian ship and a tanker against two well-armed raiders; the other was driven off and the tanker and sloop survived the action. In all, the Japanese raiders only sank or captured five ships of 36,000 tons odd. Japanese warships accounted for a further 23 ships of just over 92,000 tons but few details are known of these operations.

Auxiliary Cruisers, 1943 Onwards

The year 1943 opened with a success for us, when Raider K was detected moving down Channel on her maiden voyage. She was driven into Boulogne by our light craft and finally put out of action by the R.A.F. Intelligence had given us timely warning of this movement.

Successes for the raiders were becoming few. In June they claimed their first victim for five months, and the last three months of the year were again free from this menace. An American submarine sank Raider H off the coast of Japan in October, and she was, in fact, the last of the raiders to sail the oceans. By December the situation had improved so much that the Admiralty instructed the Commander-in-Chief in the Indian Ocean to release ships from the convoy system, as the threat no longer justified the loss in turn-round, which in this area alone amounted to 1,800 ship/days a month. Though we could not relax, our constant vigil had at last reaped its reward.

Altogether a total of nine German, three Japanese, and one Italian auxiliary cruiser operated during the 1939–45 War; two more German ships were fitted out but never got to sea, and one was sunk whilst leaving for its maiden voyage. Their characteristics were moderately high speed and great endurance, inconspicuous appearance, a good gun and torpedo armament, and ability to carry a large number of mines indiscernably. The ships were usually modern motor ships of about 5,000

to 7,000 tons with a speed of 15–20 knots; they took six to eight months to fit out. Motor ships were chosen as they could save fuel by lying stopped for long periods, but still able to get under way again instantly.[3] Their armament usually consisted of six to eight 5.9 in. guns and twin or triple torpedo tubes, and they mostly carried one or two aircraft. Supplies of fuel and provisions were sufficient for twelve months. (Raider C was away one year eight months and Raider B one year five months.)

Great use was made of disguise. Funnels and top-masts were telescopic; and dummy funnels, ventilators and samson-posts were frequently rigged. In addition, false bulwarks in well-decks, false deck-houses, boats and deck cargo assisted in the disguise. Repainting was done at sea, and sometimes so frequently that reports of colours were quite valueless 24 hours later.

Operational areas allocated to individual raiders were large and sometimes comprised an area such as the South Atlantic or half the Pacific. The German Admiralty exercised a general control over their broad strategy, arranged rendezvous with supply ships, indicated where mines were to be laid, etc., but within their allotted areas a large measure of freedom was left to the individual captain.

BRITISH COUNTER-MEASURES

I have mentioned briefly the policy and strategic dispositions to counter the raiders; in this we were dependent upon reports by ships being attacked. Compared with the 1914–18 War, wireless was a common feature in merchant ships, but its range was still limited in many, and the need of H.F. equipment was very evident. The "checkmate" system already mentioned came too late to have any decisive effect, but may be needed again.

I have made little mention of the use of aircraft in hunting raiders. They were used and did valuable work in patrolling focal areas and coastal routes. A disadvantage of aircraft is that investigation of a suspicious vessel is even more difficult from the air than from the surface. Aircraft can help but must be used in conjunction with surface ships.

What were the results of the Sea Raiders' Campaign and why did it fail? Although lack of guns in 1934 may have limited their programme, and Hitler's assurances about the date of the next war excused certain shortcomings, the German Naval Staff do not seem to have pushed their case with much vigour in the years before the War. With the vast armaments going to the other Service I feel sure that at least some auxiliary cruisers could have been ready. It seems that the German Army got the guns, Goering got the butter, and the Navy got nothing! The raider can do his best work in the early days before the enemy can organize his convoys and other defence measures; a vigorous policy even with only a few ships could have played havoc amongst our shipping in the first few months of the War. "German surface forces are so inferior in number and strength to those of the British Fleet that, even at full strength, they can do no more than show that they know how to die gallantly. . . ," reflected Admiral Raeder on the outbreak of war. Contrast this with "We started very weak at sea and even more so in the air. However, because of the very fact of our weakness, our policy had obviously to be one of aggressiveness . . ." as Admiral Cunningham observed in the Mediterranean. The failure to press home the attack

[3] Two of the early ships, A and D were steam driven but were found unsuitable and were withdrawn early on.

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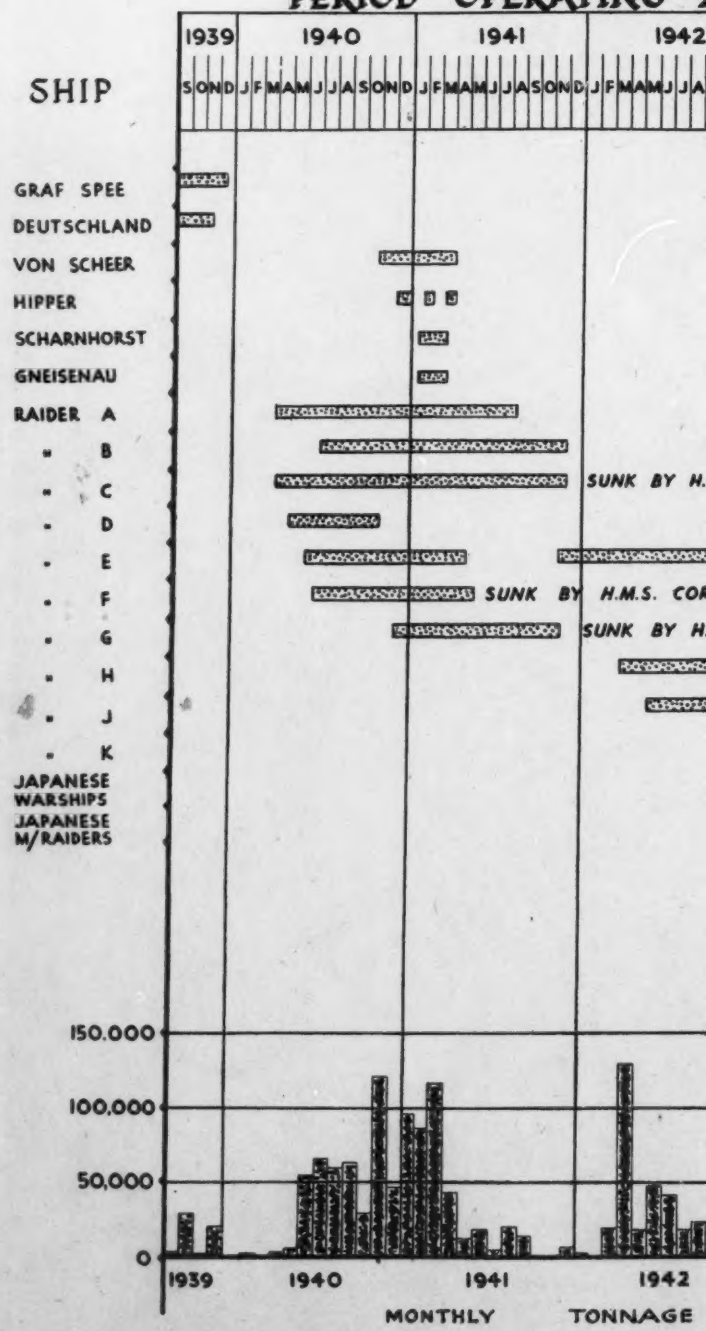
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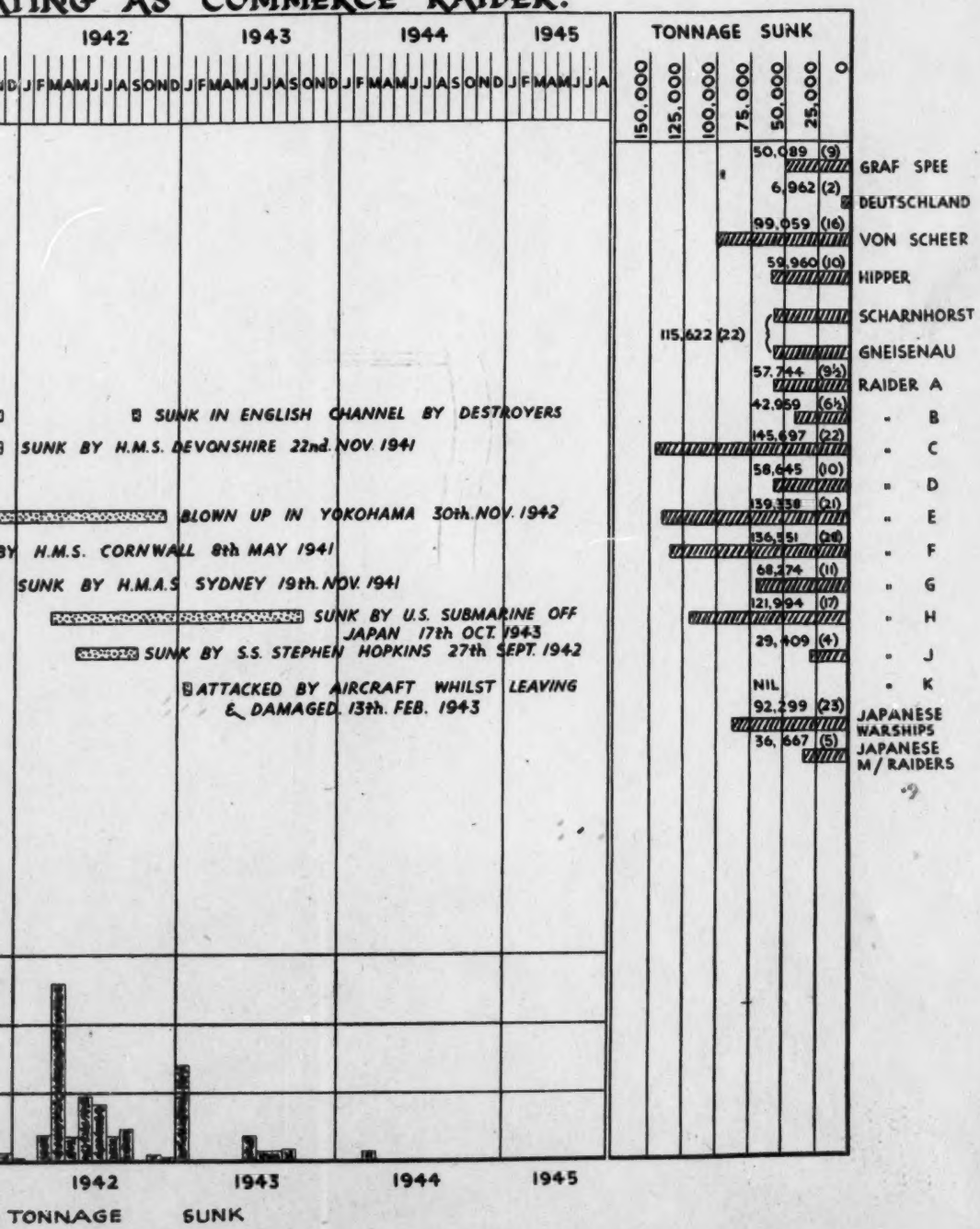

when committed, as in the case of the "Scheer," the restrictive orders which forbade the "Scharnhorst" and "Gneisenau" from attacking the convoy escorted only by the old battleship "Ramillies," and the other by the "Malaya," showed that the German naval mind did not appreciate that, at sea as well as on land, great successes cannot be achieved without great risks.

The surface raiders were swept from the seas many months before the War ended. Whether this was due, in part, to Germany's preoccupation with other things or not, we can confidently say that our counter measures were effective and that the surface raider was defeated. Their visible contribution of 1,328,739 tons was 6.3 per cent. of the total shipping lost during the War; incidentally this was almost the same percentage as that claimed by mines. However, we cannot judge the results by these facts alone, as I mentioned at the beginning of this lecture, and I ask you to visualize the vast resources in ships, material and manpower involved in hunting these raiders—resources which might otherwise have been used to fight the enemy in other fields. The lessons of history were once more proved correct: the commerce raider—at any rate on the surface—will not produce decisive results when operated by the weaker naval Power. But, even if they do not prove decisive, they can be a sore trial and we must ever be on our guard against treating this form of warfare with complacency.

THE FUTURE

Admiral Richmond, writing on this subject, said, "The English side of the *guerre-de-course* and the means adopted by the Admiralties of the past is still to be written in detail. We have all been taught that it never achieved its object, but the measures taken to prevent it from doing so have been insufficiently examined. We have been far too content to accept the dictum that a *guerre-de-course* must fail unless the main fleet be defeated, without examining the operations of the cruising craft which were rendered possible by the protection from interference afforded them by the presence of the main fleet."[4] That was written before the late war, and it is even clearer to us now that it is only by the utmost vigilance of these cruising craft that we have managed to survive so far.

I think there are few to-day who would disagree with the fact that a cessation of our sea-borne supplies would quickly bring about the defeat of this Country. Furthermore, it is still from the surface that we must launch those weapons, whether guided by human or mechanical means, which defend our shipping from the raiders on, under and above the sea. Those supplies will only arrive so long as we can create the conditions whereby our ships can pass on the seas in safety. "Command of the sea is the indispensable basis of security, but whether the instrument that commands swims, floats or flies, is a mere matter of detail."[5]

DISCUSSION

CAPTAIN E. ALTHAM, R.N.: The Lecturer has referred to the original German raiders—the pocket battleships. I would like to draw your attention to the fact there is a very fine model of one of these—the "Lützow," originally the "Deutschland"—in the public entrance to the Museum. There is a little anecdote connected with this model. It was sent to us from Germany after the War. When we opened the case we found a note, written in German, concealed in it. This was from the model maker saying, "This is the only one of my models which has survived the fire. I should be interested to know if it arrives

[4] *National Policy and Naval Strength*, p. 307–Richmond.
[5] *Statesmen and Sea Power*, p. 136–Richmond.

safely at its destination." He gave his address, and I sent a reply which duly reached him saying " We found your note. Your model has reached its destination safely—in London."

We afterwards got him to make a model of one of the latest U-boats to the same scale, and that, too, you will find in the entrance to the Museum.

There were two points in the lecture which particularly struck me. One was, as the Lecturer brought out clearly, that the German Sea Raiders could not function more effectively because they lacked the backing of a force of heavy ships. Should we be right in saying that, conversely, the ultimate fate of those raiders was largely decided by the fact that we *had* got a stout background of battleships which could neutralize such German battleships as there were, and support the forces able to go out, and eventually run down the raiders or make them take refuge in port?

The other point which I should be very grateful if the Lecturer could enlarge on relates to his examples of the tactics employed in tackling surface raiders. He contrasted the encounter between the " Sydney " and a raider, which resulted in the loss of the cruiser as well as the destruction of the enemy ship, with that between the " Devonshire " and a raider when the latter was put down without any casualties to the cruiser. How came the " Sydney " to get into such a position of disadvantage, while the " Devonshire," with the help of her aircraft, was able to deal with her raider effectively from a range of 17,000 to 18,000 yards?

THE LECTURER: Taking your first point: I think the protection of the cruising craft by the main fleet brings up the old question of whether the *guerre-de-course* can succeed in the face of a superior enemy fleet. My opinion is that the dictum still holds good, and that the raider will eventually meet defeat unless that superior fleet can be challenged and defeated. But what I wished to bring out, and is so clearly illustrated in Admiral Richmond's remarks, is that the mere fact of possessing a superior fleet, although it may hold down an enemy fleet, will not in itself secure immunity from raiders; in addition to that, one must have cruising craft and their job is important, in fact vital, to the issue.

With regard to the action between the " Sydney " and the raider, the only accounts we have are from survivors from the German raider; there were no survivors from the " Sydney." What actually happened to the " Sydney " we can only surmise: why, for instance, did she not use her aircraft: the German report mentions men running to man it, but only after the action commenced; one of the early salvoes hit the aircraft and put it out of action.

As far as I can see it was merely that the " Sydney " had not exercised sufficient caution on this occasion. I think it is understandable that, after many months out on the trade routes sighting ships day after day, it is very easy to fall into these habits, and not take full precautions; then one day you may run into a raider, as the " Sydney " did.

I quoted the two examples in order to bring out the extreme precaution one has to take under these circumstances.

GROUP CAPTAIN C. E. CHILTON, R.A.F.: The Lecturer very rightly paid tribute to the part played by aircraft in these operations, and it is quite clear from the chart exhibited, that the vital focal areas were well patrolled and thus free from the attentions of the various sea raiders. However, I would be interested to know if the Lecturer would advise, in so far as future operations might be concerned, that each surface hunting group should include its own carrier, since this must ease the problem of searching vast expanses of sea, etc., and give it a striking power at longer range.

In regard to the diagram showing the various raiders at sea during the war years and the tonnage destroyed by them, I notice that no reference is made to the " Bismarck " and " Prinz Eugen "; admittedly they were brought to action and destroyed before doing damage to commerce but they had put to sea with definite instructions to act as

commerce raiders; the diagram might have been more impressive if they had been shown on the credit side!

Lastly, I wonder if the Lecturer would care to give an opinion as to the relative value of submarines and surface raiders from the purely economic aspect: which is likely to pay the larger dividend in relation to the manpower, resources, etc., required to get them to sea and maintain them?

THE LECTURER: As regards the "Bismarck" and the "Prinz Eugen," I did not include them because the period during which they were out was so short it would have been almost impossible to show them on the chart. They did not, in fact, operate on our trade routes as commerce raiders, though it is true that they left with that intent.

As to the future, I think if we have the carriers they would certainly be of value on this sort of work. In that connection I think it is interesting to recall one of Mr. Churchill's directives at the beginning of the late war, in 1939, before these groups were instituted. He said he wanted hunter-killer groups instituted, and they were to consist of one killer—a ship which could beat a pocket battleship—or, if not available, two three-quarter killers and an aircraft carrier, the whole to be escorted by four ocean-going destroyers and accompanied by two or three fast tankers. Although that was Mr. Churchill's idea in 1939, and it was perhaps a bit lavish, I think that it is still sound for the future if we again have powerful raiders with which to deal.

As regards the relative value of submarines and surface vessels as raiders, I am afraid I cannot give you any actual figures; but, as I asked you to bear in mind during the lecture, you cannot judge the efficiency of the surface raiders by their sinkings alone; and the other assets or results cannot be measured: for instance, the dispersion of our forces which enabled the U-boats to have a freer hand in tackling our convoys—such matters as that cannot be measured.

I would say that a few surface raiders operated efficiently, would be an economical project. The number of ships employed, men and materials and so on, in hunting a few of these raiders would cause a tremendous dispersion of our forces and materially assist the other types of raiders—that is, submarines and aircraft.

CAPTAIN H. H. FANCOURT, R.N.: I think you mentioned that from time to time raiders were intercepted by aircraft on the trade routes. I would like to ask whether you feel that, now when we have no aircraft in cruisers, the cruisers we would employ to-day would be as effective as those you have referred to.

THE LECTURER: Certainly the aircraft in cruisers assisted materially; but whether it is the Admiralty's policy in the future to put them back into cruisers or not, I regret I do not know.

THE CHAIRMAN

I would just like to make a few remarks on the lecture. I will take first of all the question of aircraft working with these groups. As I understand it, for choice a hunting group would never be sent out unless it had aircraft with it. Whether the aircraft would be shore-based or carrier-borne would depend on the circumstances. I should say that it would probably be one or the other, though the Americans still have aircraft in their cruisers and their battleships, which is something to take note of and consider.

I would like to say one more word on the point which has been raised of a cruiser or surface ship approaching an unidentified merchant ship. It is always an extremely difficult thing and one that requires great care because, quite apart from the fact that this might be a disguised heavily-armed ship, you have also to bear in mind she may be working with submarines and trying to jockey you into a position where you can be attacked by one or more of them. That was a situation which some Captains of ships had to face during this War, and it is not anything for which one can lay down a hard and fast rule.

The lecture has brought out very clearly not only what these raiders were able to do, but also what more they should have achieved if Admiral Raeder, who had a pretty sound

knowledge of sea power, had had his way. But again in this War we have had an example of a nation setting out to get world domination being led by people who did not understand sea power and who set out on a war without being prepared at sea.

I think another example was the case of the *Luftwaffe*: Germany had a considerable *Luftwaffe* and yet not a single aircraft that could fire a torpedo. I was Director of Operations at the beginning of the War and we were very strained to keep the sea communications open. If, in addition to the strain we then had, the *Luftwaffe* had really been effective at sea with torpedo-bomber aircraft, we should have been even more hard put to it than we were, and I very much doubt if we could have kept the sea communications going.

There is one other point I would like to bring out and it is that the steady flow of supplies which came in by the convoys and by ships sailing unescorted was really maintained through the courage and determination of our merchant seamen. We owe a very great deal to them, and we should never forget it.

Finally, on your behalf, I would like to thank the Lecturer—Commander Morgan—very much for his very well thought out and able lecture and I should like to congratulate him on the skill with which it has been presented. (*Applause.*)

The vote of thanks to the Chairman was proposed by Commodore R. Harrison, R.N.R., and carried by acclamation.

THE GAS TURBINE AND ITS PLACE IN SERVICE AVIATION

By Air Commodore F. R. Banks, C.B., O.B.E.

On Wednesday, 17th November, 1948, at 3.0 p.m.

Air Marshal Sir Alec Coryton, K.B.E., C.B., M.V.O., D.F.C., in the Chair

The Chairman: I can think of no one more qualified to give a lecture on this subject than Air Commodore Banks. In the 1914/1918 War he served in the R.N.V.R., in mine-sweepers, in high-speed motor-boats, and C.M.B's. After the war he took on marine Diesel engine development and, in 1924, transferred his attention to the aero-engine with which he has been connected ever since.

His first task on taking on aero-engines was to develop an airship engine on behalf of the Air Ministry. Subsequently he joined the Anglo-American Oil Company, specializing in fuels for aero-engines. It was he who was responsible for the production of the special fuels for the winning Schneider Trophy team and for the World's Air Speed Record, in 1931. During the last war he was respectively Director-General of Engine Production and Director of Engine Research and Development at the M.A.P. In 1946 he went back to The Associated Ethyl Company as technical manager and chief engineer, the position he now holds.

LECTURE

I AM diffident in giving this lecture because I realize that I am speaking to those who know much more than I about military matters and future planning; but the lecture would not be very stimulating to you if I were to keep strictly to technicalities of the aviation gas turbine. Therefore, I am going to take my courage in both hands and give my views, for what they are worth, on the influence which the gas turbine will exert upon the thinking of those who have to plan ahead for our military well-being in the next ten or fifteen years.

The advent of the aviation jet propulsion gas turbine in the recent war has probably caused the Air Staffs of the World more headaches since the War than any other military or technical development—excepting, of course, the atomic bomb and the application of atomic energy for military purposes. It was to be expected that an entirely new development such as the aviation gas turbine would bring many fresh problems of its own, particularly since it is the only prime mover which has been evolved in more than forty years of practical aviation, capable of competing successfully with the piston engine. However, it has not only brought the problems of a new engine but it has, because of its particular operating characteristics, also altered the parameters controlling the shape of future aircraft; so that any preconceived ideas which those responsible for forward (air) thinking may have had before the gas turbine came along, must have been upset and very considerably modified. Certainly, the well-meaning but somewhat adolescent claims of the gas turbine protagonists at its birth and in its very early life only served to confuse further the minds of those who had to do something about ordering new aircraft types. Even when we had the simplest turbo-jet, such as the Whittle type Rolls-Royce Derwent and Nene, also the de Havilland Goblin engines, there were those who said that the piston engine would die almost immediately and there would be jet aircraft flying the Atlantic and the Empire air routes within five years. That was five years ago!

Sometimes one thinks how relatively simple everything would now be if the gas turbine had not been thought of or had proved impracticable for aviation, and we had only to consider the piston engine for our future aircraft types. There

never has been an easy way in aviation and woe betide any country or individual who thinks to the contrary! The results of inertia and muddled thinking are clearly apparent in certain countries and firms to-day; where there was once a successful aircraft industry or a flourishing aircraft or engine manufacturer, there is now either a nationalized mess or a lifeless organization.

The responsibility of the Services is, of course, to be prepared at all times for any eventuality and to plan for the future, so that the Country can always have the best means of defence and, later, offence—since it is, apparently, Democracy's doubtful privilege always to suffer being hit on the nose in the first place, before it can hit back. Still, those who have deliberately started the really big wars in our lifetime have not been singularly successful in bringing them to a conclusion satisfactory to themselves. Because of this fact, there is all the more reason for striving to lead the World technically, and the gas turbine should prove to be one of the principal assets we have, both for our military and industrial well-being.

We are now in a transitional stage, where we know much of the possibilities and limitations of the piston engine, but are not so certain of what we will eventually get from the gas turbine. This makes "crystal gazing" and forward planning a somewhat difficult matter. Since we of our generation have been living a kind of sine curve of peace, war, peace, war, and now what is presumed to be peace, some "crystal gazing" is inevitable; because no fresh war is quite like the one which has preceded it and there always remains the unknown. Despite all these difficulties and uncertainties, I do not think there need be too much conjecture in regard to the type of aircraft to come in the next ten or fifteen years; and we have some three decades of piston engine experience to help forward the development of the gas turbine. While it is necessary to consider only practical possibilities, our technical aim must be set sufficiently high and we must not easily be deviated from our purpose.

FORMS OF GAS TURBINE ENGINES

Since there often appears to be some confusion in terms, if not in mind, in regard to the various forms of gas turbine, those considered in this lecture are the three essential types—the turbo-jet; the ducted fan turbine; and the propeller turbine.

In the case of the turbo-jet, or the jet propulsion gas turbine, the total air for functioning the engine, and also for propelling the aircraft, all passes through the engine itself. The ducted fan arrangement could also be considered as another variety of the turbo-jet. Here, the air is divided after it enters the nose of the engine; some goes to function the engine and to produce energy in the form of jet thrust, and some is grabbed by a multi-bladed fan, driven by the engine and enclosed in an annular duct surrounding the engine proper. The air thus grabbed emerges at the rear of the annular duct and combines with the discharge from the jet pipe to provide increased total thrust which, because of its lower velocity, is more efficient than the pure jet, for the take-off and climb conditions of the aircraft.

The propeller turbine takes less air through it than the turbo-jet so that, in effect, the turbine wheel is bigger in relation to the compressor, with the result that the surplus energy of the turbine is used to drive a propeller, through double-reduction gearing. In the case of the propeller turbine, the proportion of power available to the propeller, and that used in the form of jet thrust, can be varied within wide limits, but in present engines about 80 per cent. of the power is absorbed by the propeller and the rest is discharged at the rear of the engine as jet thrust, which has useful value at cruising conditions.

The Turbo-Jet

The turbo-jet, as conceived and developed by Whittle, is basically a very simple and light engine but, being a turbine, it lacks the operating flexibility of the piston engine and it has a relatively high fuel consumption. It is desirable that the turbine should always run at or near its maximum speed (r.p.m.) and it cannot, in its present form, be cruised economically at (nearly) half speed like the piston engine; nor is it likely to achieve the degree of flexibility of the piston engine in meeting widely different aircraft requirements; by relatively simple changes of supercharger or supercharger gear ratio, the same basic design of piston engine can be used in a fighter, a bomber, a reconnaissance or patrol aircraft and even a civil transport machine. There is, however, another way of looking at the turbo-jet, in comparison with the conventional piston engine; it is that all jet aircraft will fly near to their critical Mach No. and, therefore, will not have a wide speed range. In this respect the turbo-jet might be said to fit all types, which will only differ in size but will be very similar in their flying characteristics and operating inflexibility, one to the other.

The turbo-jet is, virtually, a "full throttle" engine and because of its lack of operating flexibility and high fuel consumption, coupled with the fact that it produces much more power than the piston engine, size for size, the aircraft for which it is intended must be designed to meet very specific requirements.

It was supposed, in the very early days of the gas turbine, that the engine would be tailored or designed to fit the particular aircraft. The thought behind this was that the turbo-jet, in its original (Whittle) form, was so simple to manufacture that it would be a comparatively easy matter to build an engine for each and every new aircraft; particularly since it is so important, in view of the operating limitations of the turbo-jet, to make a successful match with each particular aircraft. This idea has, however, now been discarded for the very simple reason that it is not practical to build a new engine for every new aircraft requirement. It would be prohibitively expensive, both in time and money, because the engine usually takes longer to build and develop than the airframe and it must have as much development and running time as possible behind it, both on the bench and in flight. Four or five years have, to date, been considered necessary in order to design and develop a prototype piston engine, ready for production; and, with the exception of the simplest form of (Whittle) type turbo-jet, this period should, for the time being, apply also to the turbo-jet and propeller turbine of the axial flow type, at least until more experience is gained of these engines.

This does not conflict with what has been said previously, but merely means that if there is an original aircraft requirement which demands a new engine it will be the responsibility of the engine and the aircraft manufacturer to co-operate and see that their projects are properly timed to mate together, allowing for all differences in the respective design, development and manufacturing times. Then, after the complete aircraft, with its engine, is in service, any further and near future aircraft requirements can probably be met by suiting them to engine availability. That is to say, the arithmetic will be reversed and the new aircraft will be designed around the available engine.

Naturally, there will be a fairly continuous need for new engine types, as there always has been, and this is no different from the experience we have had already with the piston engine, where each new aircraft phase, to meet fresh military requirements, has demanded a new engine or, at least, the radical re-hashing of an existing

type. The life of an aviation engine, from the finished prototype or Mark I model, through the various later " Marks," until it is finally rendered obsolete, is in the region of ten years, but is sometimes longer in certain cases.

There are at present three types of turbo-jet engine. The first is the classic Whittle type as exemplified by the Rolls-Royce Derwent and Nene engines, of 3,500 pounds and 5,000 pounds sea level static thrust, respectively. This type has a double-sided centrifugal compressor driven by a single stage turbine wheel, and separate combustion chambers. The second type is the De Havilland Goblin, which is basically similar to the Whittle but has a single-sided centrifugal compressor. The third is the axial compressor type favoured by Armstrong-Siddeley (ASX), Metro-Vick (Beryl) and, in America, General Electric (T.G.180 and 190) and Westinghouse. Of these, the Metro-Vick and Westinghouse use the annular combustion chamber and the others employ separate chambers. The Goblin and the axial engines mentioned above are variously in the 3,000, 4,000 and 5,000 pounds static thrust classes.

As in the case of the piston engine, where the relative merits of liquid and air-cooling used to be hotly argued, so it is now with the gas turbine ; but the argument here is whether or not the centrifugal or the axial compressor will survive. In my opinion, each has certain advantages denied to the other and, therefore, both will be used on their respective merits.

The centrifugal compressor offers the very considerable advantage of inherent robustness and resistance to serious damage by foreign bodies or ice, which may pass through it. Also, it does not tend to drop in efficiency during its working life. Centrifugal compressors will undoubtedly be built in the near future, having (adiabatic) efficiencies of well over eighty per cent. for pressure ratios of 4/1 and over. The disadvantages of the centrifugal compressor are that it is of larger diameter than the axial type for a given air flow, and cannot be designed for such high pressure ratios for the same overall efficiency, as the latter.

The axial compressor, because it offers the minimum diameter for maximum air flow, will be used for absolute (the highest) performance military aircraft, such as interceptors and high speed bombers. It will also be used where fuel economy is of paramount importance, since it is capable of much higher pressure ratios and higher efficiency than the centrifugal type. In my opinion, the latter will not compete with the axial in this respect.

Military aircraft of the future will all be " bulk limited " because of their speed, so that both the engine and the fuel carried must offer the smallest bulk possible in order to make way for military equipment and the various means (radar and the like) for using the equipment to the best advantage. The axial compressor helps in this direction and, although it is more sensitive to damage than the centrifugal type and may drop slightly in efficiency during its working life because of dirt and slight damage or erosion of its many blades, these disadvantages cannot be overriding where maximum performance is demanded and where, after all, the life of a first line military aircraft is relatively short ; certainly this is the case in war, where performance is everything.

The turbo-jet started its life in fighter or pursuit aircraft and it is now firmly entrenched as the prime mover for this type of machine. In fact, it is the one sphere of activity from which the piston engine has faded, or is rapidly fading. At the present time, the development of the turbo-jet is ahead of that of the aircraft in which it is fitted. Practically all the World's jet fighters now in normal service or

squadron use have a Mach No. limit of around 0.8 ; although it is known that there are prototypes, in this and in other countries, under development and in the flight testing stage, which have a much higher critical Mach No.

I do not think (and here I tread on thin ice) that the jet fighter will be of much use as an escort to the propeller driven bomber or the jet bomber, because of the difficulty of carrying the extra fuel load. In this connection it seems that it would be more practical to resort to a " parasite " attack machine which would be carried in an escort aircraft, accompanying the bombers, on the lines of the experiments which are now in progress in the States. In this case, the " parasite " might be propelled by a turbo-jet or by liquid rocket motor. It might also have to be jettisoned, or considered expendible, the pilot escaping by parachute, because the escort or mother aircraft might be involved in action and it would be impracticable to effect a " hook-on." The very fast jet bomber at great altitude may have a fair chance of escaping attack from piloted aircraft, if not from guided missiles with proximity fuses. In any case, once it manages to arrive over its target and discharges its bombs, the jet-bomber probably has a better chance than the escort fighter, which might still be retaining a large proportion, if not all, of its military load.

I think that in the next ten years there will be in service practical fighter or interceptor aircraft, capable of level flight at a critical Mach No. of 0.90. There are bound to be short endurance interceptor and attack machines, propelled by liquid rocket motors, which will fly at super-sonic speeds, along the lines of the experimental aircraft now flying in the U.S.A. These do not come within the scope of this lecture but they should be mentioned.

To return to the turbo-jet fighter, it is still very open to question whether or not a single or twin-engined machine will be the final answer. This is a very important decision to make because it influences future engine development. As I see it, in order to get to maximum operating altitude and maintain the highest speed possible at that altitude, the all-up weight of the aircraft, the frontal area and the wetted surface must all be at the minimum possible, other things being equal. If, therefore, this is the case, then the aircraft will probably have a single engine of high specific output, *i.e.*, high thrust per square foot of (engine) frontal area and high power/weight ratio. Such an engine must also be reasonably economical, although it will be necessary to strike a balance between any increase in engine weight, to achieve this, and what it is practical to save in fuel bulk.

This contradicts my previous thoughts and views of about two years ago when I said that pursuit aircraft, because of their thin section wings, would be unable to carry armament and fuel in the wing and, therefore, this would all have to be stowed in the fuselage. Two engines would then be involved, and would either have to be put in the wing roots or slung further outboard under the wing. It now appears that, for the best results and to avoid excrescences on the wing, the engine and the fuel and armament may all have to be accommodated within the fuselage.

The question of the engine power required and what will be available in, say, the next ten years is not easy to determine. But I do not think that a sea level static thrust of 10,000 pounds will be exceeded during this period, nor do I consider that higher thrust per engine is needed, because of the advancements which will be made and, in fact, are already being made in the aerodynamic field.

Naturally all this is conjecture, but if you will cast your minds back about two years when the Gloster Meteor raised the World's Absolute Air Speed Record to 616 m.p.h., you may remember that the total available engine thrust was in the order

of 8,000 pounds, or 4,000 pounds per engine. The Meteor was then of relatively ancient design, aerodynamically, even though it is still one of the most formidable jet fighters in service to-day. But the De Havilland 108 experimental machine, with only about 3,750 pounds of maximum thrust available, would probably have raised this record by some 30 m.p.h. had not the very unfortunate accident happened to Geoffrey De Havilland ; and the Americans have since raised it, in fairly large jumps, until it now stands at about 670 m.p.h. The important point to appreciate is that these later aircraft had less than 5,000 pounds of available thrust and most of the engines did not give more than 4,000 pounds thrust. The last successful attempt, of more than 670 m.p.h., by the North American XP 86, was apparently accomplished with full military load—guns and ammunition.

It will be appreciated that aerodynamic progress is already such that great economy in power can be made by proper application of aerodynamic knowledge, and the days of " brute force " are numbered. No longer should power be wasted ; and the whole operating economy of future aircraft is now entirely dependent upon the proper integration of airframe and engine for the particular purpose for which the aircraft is intended. All this sounds so obvious, but one has not to look back very far to be amazed at what engines have been asked to drag through air.

The rate of increase in engine power of the individual engine will, therefore, be largely determined by the advances made in the realm of practical aerodynamics ; and my guess is that there will be a steady upward trend from the present maximum of 5,000 pounds thrust per engine, to about 10,000 pounds, in stages of approximately 2,000 pounds, in the next ten years or so.

The average specific fuel consumption of the present-day turbo-jet is in the region of 1 lb. per pound of static thrust at sea level conditions—in fact, it is slightly above this figure in most cases ; but, for the engines just envisaged, the specific consumption should be reduced to about 0.9 lb. per pound of thrust in the next two or three years and to 0.85 lb. in five or seven years from now. This mainly applies to those turbo-jets intended for fighter or interceptor aircraft, but an improvement in their fuel economy must be carefully weighed against any extra engine weight or complication necessary to achieve such economy. For the jet type bomber, fuel economy is more important and some increase in engine weight and mechanical complication will be justified if the bulk of fuel carried can be appreciably reduced.

The Ducted Fan Turbine

Earlier in the lecture the ducted fan engine was mentioned. This is also known as an augmenter ; that is, it augments the jet thrust. There has always been considerable argument about this type of engine and on the question of its usefulness or otherwise, because it has not yet been tried in the air and no aircraft has been specifically designed for it. Until this has been done, and some practical results obtained, its value will remain largely a matter for conjecture. From theoretical considerations, backed by some testbed results, the characteristics of the ducted fan engine can, however, be fairly closely assessed. First, it produces a higher static thrust and has better propulsive efficiency at relatively low forward speeds, compared with the turbo-jet engine. This permits a shorter take-off run and also an improved rate of climb. Secondly, its specific fuel consumption is lower than that of the turbo-jet because of its thrust characteristics. The disadvantages are that it is of larger diameter than the turbo-jet and, in level flight, the augmentor does not apparently do much trade over and above a speed of 500 m.p.h., unless extra fuel is burned in the duct behind the fan to increase the discharge velocity of the air, which is a great

expense in fuel consumption. This is not easy to do when one considers that the duct will normally be made of light alloy. To render it relatively safe from the point of view of fire hazard, considerable weight would probably have to be added in the form of stainless steel lining and refractory lagging.

I think, therefore, that the ducted fan engine, if it is used at all, will probably be considered for the bomber rather than for the fighter or interceptor.

There are three practical methods of augmenting the thrust of the turbo-jet engine to improve take-off, particularly from high altitude airfields and in tropical conditions, or to better its rate of climb. These are, (*a*) by the injection of liquids such as ammonia or water/methanol into the engine, usually via the compressor; (*b*) by after-burning, *i.e.*, burning additional fuel in the jet pipe; and (*c*) by "cold" rocket or Jato, or by the bi-fuel rocket motor.

Of the three I prefer after-burning because it makes use of the normal engine fuel and, therefore, no special tankage is necessary. It is also more economical in fuel consumption than the other methods. About two to two-and-a-half pounds of fuel (in addition to that consumed by the engine) are used in after-burning for every one pound increase in engine thrust; whereas at least double this fuel quantity is required for the same thrust increase in the case of the other methods. The disadvantage of after-burning is that it involves some increase in jet pipe diameter which, in turn, is reflected in weight and, sometimes, in fuselage size. The bi-fuel liquid rocket motor is small and would not affect the jet pipe or fuselage size, but the stowage of its fuel might present some difficulty and, in addition, the fire and explosion hazards would be increased in the event of battle damage.

I am uncertain whether these methods of thrust augmentation will have any real value in level flight, because it is presumed that all sub-sonic fighter aircraft will have sufficient power to be capable of flying at their critical Mach No. and, therefore, no appreciable increase in performance will be possible by additional thrust under these conditions. By the term "critical Mach No." I mean the Mach No. at which the "drag" of the aircraft begins to increase so rapidly that extra power has very little effect. But, of course, in the case of fighter aircraft, even a small increase in performance may make all the difference between hitting and missing the enemy and, therefore, some method of thrust augmentation may prove worthwhile however small the resultant speed increase.

THE TURBO-JET BOMBER

Turning now to the turbo-jet bomber: it will, at first, use similar engines to those developed originally for fighter aircraft because no others are available. Since it is not at present practicable or advisable to have all the available power in a single engine, a multiplicity of engines will always be used in the bomber case. Within the next ten or fifteen years turbo-jet engines intended for bombers will have to be developed to give high fuel economy. That is to say, their cruising fuel consumption at operating altitude should be at least 20 per cent. better than that obtained with present engines. To achieve this for cruising speeds of, say, 500 m.p.h., the ducted fan engine may then have some practical application; but later, when speeds are, say, 100 m.p.h. higher, it will probably be necessary to resort to a compounded jet engine of fairly high pressure ratio, i.e., with two compressors, in series, on separate shafts. The reason for this is that the flight economy of a jet aircraft is dependent not only upon the operating efficiency of the engine but on the propulsive efficiency of the jet, which latter increases with aircraft speed. In fact, unless the aircraft is

designed for a speed which will ensure good propulsive efficiency there is some disadvantage in high pressure ratio jet engines, where the turbine inlet temperature may be raised, with accompanying increase in jet velocity. Therefore, although the engine might in itself be an economical energy producer, the air miles per gallon may well be reduced because of lower propulsive efficiency; since the extra energy produced cannot be used effectively.

It is possible, by not too complicated arithmetic, to produce a fairly close estimate of the maximum effective operating range of the turbo-jet bomber; but these figures might be very misleading unless all factors are known and taken into consideration. By this I mean that the exact requirements of bomb load, height and cruising speed, etc., etc., must first be known in detail. Even then it will largely depend upon the ingenuity of the aircraft designer as to how closely these requirements can be met or exceeded, and for the shape and size of the aircraft necessary to do the job.

What all this means is that a (compounded) jet engine will, eventually, have to be designed to give a specific fuel consumption of not more than 0.8 lb. per pound of thrust at static sea level conditions and, in its later development, 0.75 lb. per pound thrust.

In this Country or in cold climates, at sea level conditions it may not be necessary to resort to jet assisted take-off devices (Jato), but these will certainly be demanded for operation from high altitude airfields and in tropical conditions.

As mentioned previously, I consider that the jet bomber must be a very fast machine because it may not be possible to provide it with an escort except, perhaps, in the form of a similar machine carrying a " parasite " aircraft for attack/defence purposes.

For long ranges the jet bomber will have to keep strictly to its altitude and flight plan or flight trajectory; otherwise at any appreciably lower altitude than the optimum it probably would not get back home because of the adverse effect of the lower altitude upon fuel consumption. This is particularly important in the case of " boomerang " flights where the military aircraft, unlike the airline machine, flies to its objective and then has to turn around without landing and must, if possible, get back to its home base.

There is also the question of improved airfield control, since it will not be possible to " stack " this type of aircraft over the airfield, and it must be brought in immediately it returns from its mission. This does not, however, present quite such a problem as the jet type civil transport or airline machine, because the military aircraft is under unified ground control with all personnel under strict military discipline; and the experience of Bomber Command in the recent war should go a long way in solving this formidable problem. But it is formidable.

There is little more to say of the jet type bomber at this stage except that future aircraft of this type will probably carry a crew of two only and will be equipped with every possible device for blind-flying and for " searching " or " scanning."

THE LONG-RANGE BOMBER

We now come to the question of the really long-range bomber aircraft and its power plant. In this particular case there are, at the moment, two choices of engine. The first is the compounded piston engine, where a high degree of fuel economy (low specific fuel consumption) is obtained by utilizing the exhaust gas energy to function

a turbine which, in turn, drives the supercharger of the engine. The second is, of course, the propeller turbine proper. Since too much effort is required to build both larger piston engines and, at the same time, develop the gas turbine, we are limited to existing piston engines having a maximum of about 3,500 b.h.p. This power could, however, be increased by means of compounding to something over 4,000 b.h.p. and a cruising power of 2,500/2,800 b.h.p. maintained at 40,000 feet. But it is also possible to build a propeller turbine of high fuel economy within the next ten years to give, say, 3,000 s.h.p. at the same altitude.

The Propeller Turbine

If there is a case for very long ranges in the future, then I would favour the propeller turbine, because I am sure that one could be built which would give an equivalent cruising fuel consumption in the order of 0.42 lb./s.h.p./hr. ; and although the compounded piston engine would probably have a lower cruising fuel consumption of about 0.38 lb./b.h.p./hr., it would be heavier and have a much higher installed " drag " than the propeller turbine because of its cooling requirements. Therefore, although the propeller turbine will have a higher specific fuel consumption than the compounded piston engine, the air miles per gallon of the propeller turbine aircraft should not be inferior and, what is very important in the case of a military aircraft, the propeller turbine machine will probably cruise at a higher percentage of its maximum power and speed than its piston engined rival.

Speed is bound to be one of the most important factors, if not the most important factor, in very long-range bombing missions ; and since the gas turbine lends itself to very high maximum powers, the aircraft in which it is fitted will be able to fly at high speed and so avoid the danger, or reduce the chances, of being shot down before it completes its mission. The propeller turbine seems, therefore, to be the obvious choice and there is time to develop such an engine, particularly because the problem of building an aircraft for a range of 10,000 miles (say, 12,000 miles in still air) is a formidable one. Calculations have shown that the aircraft for such a range, to fly at 40,000 feet and 500 m.p.h., with a useful bomb load, would be about twice the all-up weight of the Brabazon I, or about 500,000 pounds! This assumes a propeller efficiency of plus 80 per cent., which may be difficult to attain in practice.

In regard to the question of propeller efficiency at forward speeds up to about 500 m.p.h. and at high altitudes ; it was previously thought that the efficiency would drop off rapidly at such speeds, but it is now considered that an efficiency of about 75 per cent. is attainable and, perhaps, even 80 per cent. If this were to be the case then it still makes the propeller turbine an attractive proposition for long-range operation if not for the extreme range just mentioned.

As a matter of interest, on this vexed question of range and fuel economy, I remember a case towards the end of the recent war when we were asked to consider a power plant for a reconnaissance aircraft of long duration, i.e., 25 hours in the air and equivalent to 7,500-10,000 miles range, according to the cruising speed. Calculations disclosed that there would be a difference of 60,000 lbs. in the all-up weight of the aircraft in favour of a (compounded) piston engine giving a specific cruising fuel consumption of 0.34 lb./b.h.p./hr. compared with 0.44 lb./b.h.p./hr. offered by a conventional piston engine.

AERODYNAMIC FEATURES OF FUTURE AIRCRAFT

I am hardly qualified to discuss the shape of aeroplanes to come, or their aerodynamic features, but a long experience in aviation does permit one to have certain

views. Therefore, a few words on this particular subject may not, I hope, be out of place.

I do not think that the tailless aircraft (I include in this category the extreme version—the flying wing) will persist in the military sphere; although there is more chance of it doing so here than in the field of airline operation because, in the former case, a high density load is usually carried which can always be kept closely packed around the C.G. of the machine, whereas with the changing (passenger) loads of airline aircraft it would be difficult to keep the C.G. position within the close limits necessary for the tailless aircraft.

There is another potential disadvantage which, I think, would become very real in time of war. This concerns the control surfaces of the tailless machine, which are situated at or near the wing tips.[1] If these are shot away or suffer battle damage then there is little hope of getting the aircraft back safely and, in nine cases out of ten, the pilot and crew will have to bale out; whereas a good deal of damage can be inflicted on the conventional type of machine which has a tail, and it will still get home. There were cases, in the recent war, of a large part of the wing being completely shot away and the aircraft brought back safely by its crew.

It is also well known to many of you that an aircraft during its Service life will suffer many necessary modifications to fit it for roles different from the original and also to keep it up to date as a military weapon, where it is not practicable or possible to build a new aircraft in the time available. Often, when this occurs, the centre of gravity of the aircraft is affected and shifted; although it is purely my personal opinion, I think that the tailless aircraft would have severe limitations as a military machine in this respect. There is, however, one type of tailless aircraft which will undoubtedly have a place in military aviation because of the really high performance it offers; this is the Delta wing. If this is considered at all it cannot, in my opinion, be developed for full Service use within the next fifteen years.

The aircraft we shall see within this time will be mostly conventional in form, but will have swept back wings and also some sweep back of the tail. In any case, I feel that a tail is necessary for these fast machines, both for controllability at take-off and landing. I realize that these remarks of mine are somewhat controversial and conjectural and I am liable to be " shot down " by the tailless protagonists; but I offer them only as a basis for constructive argument.

FUEL

Something should now be said on the matter of fuel for military gas turbines. This is a very difficult question at the present time because the fuel supply, where large quantities are concerned, is a matter of oil world economics and, until the present position is reversed with the gas turbine in the majority and the piston engine in the minority, the true position cannot be known or properly assessed.

At the moment kerosene (or what is generally known here as paraffin) is used for gas turbines. The engines are usually cleared for operation on normal 100/130 grade leaded fuel (aviation gasoline) in the event of an emergency and where it might not be possible to obtain kerosene and, also, if there is available only one bulk storage

[1] The cause of the catastrophic crash of the Northrop Y.B.49 turbo-jet bomber has not been exactly determined; but it is now the opinion of the U.S.A.F. and the Company that this might have been due to structural failure of a wing tip and the resulting carrying away of an elevon control.

system for both piston engined aircraft and the gas turbine variety. The former are in the majority at the moment. Turbo-jets for the U.S. Navy, for instance, are tested on kerosene, but use aviation gasoline on shore and in carriers because of the problems involved in storing two different fuels. The U.S.A.F. also test their engines on both fuels but, at present, use kerosene in service.

It is more than doubtful, however, whether kerosene will be available in time of war; since gasoline, or petrol, remains the product in greatest demand from the crude oil, and because to make gasoline, the refinery charging stock comprises a large proportion of the "middle of the barrel" products of the crude oil which include kerosene, it is not difficult to see that anything taken from the "middle of the barrel" will tend to reduce the supplies of gasoline. The demands of surface transport would still be greater in war than those of aviation and, if I remember rightly, 12 (U.S.) gallons of petroleum products were used on the ground in the recent war for every one (U.S.) gallon used in the air.

Although the turbine can undoubtedly be developed to use higher flash point fuels, which would considerably reduce the fire hazard in the event of a crash, the military demands for gas turbine fuel would be so great in time of war that it would not be practically possible to supply a high flash point fuel, which would have to come from the "middle of the barrel" and thus reduce the gasoline output. Therefore, gas turbine fuel for military purposes will probably contain a large proportion of hydrocarbons in the gasoline boiling range.

I have not so far touched upon the question of icing in flight and the difficulties in preventing icing from causing damage and complete engine stoppage. These problems are being actively dealt with, both in this Country and in America. There is no doubt that they can, and will, be overcome; but it is too early at this stage to give any idea of the particular anti-icing method, or methods, which will be finally approved. I think that another 3–5 years will be needed for proper anti-icing systems to be evolved which can be incorporated as an integral part of the engine design. To date, little icing trouble has been encountered, principally because the type of aircraft using the gas turbine is the fighter which, in its present form, cannot be considered an all-weather machine. But the question of icing is a formidable one for the all-weather fighter and the bomber, particularly where the latter has to keep rigidly to its flight plan and altitude if it is to achieve its objective. Even where there is little risk of icing at altitudes of around 40,000 feet, there is still the problem of icing at lower altitude when coming home and being landed.

CONCLUSION

In conclusion I would again offer my sympathy to the forward planners who have to make all the right guesses now or face considerable bother in 10 or 15 years time, if their prognostications are proved wrong. If the piston engine had remained the only available prime mover for aviation, then forward planning would have been comparatively easy. The gas turbine is undoubtedly the coming engine. In fact, it has already arrived, but it is still in its infancy and how it will eventually develop will largely depend upon the framing of future aircraft requirements.

There is no magic in the gas turbine, but we have not yet reached the same stage which the piston engine had attained at the start of the recent war. Even then some guessing had to be done because we did not know the exact progress then made by other important countries and our enemy. It looks as if future advances in aerodynamics and, consequently, in aircraft design will eventually bring us to a stage

where all the World's first-class military aircraft will have very much the same performance; particularly since we now have an engine, in the form of the gas turbine, which can practically provide all the power needed. This does not mean that there will be no need for continued detailed improvement of the aircraft and engine in the future; that state will never come about in our lifetime.

Finally, in this Country we still have the lead in the gas turbine in all its forms, and we should be able to retain this lead indefinitely. The United States is certainly ahead, at the moment, in aerodynamic progress, and their enormous research facilities, in the form of large high-speed wind tunnels, etc., make it difficult for us to level up with them in the aerodynamic field. But this Country has always been blessed with practical thinkers and men of imagination, so there is every reason to hope that we shall not be too far behind, if we are behind at all, in ten or fifteen years time.

DISCUSSION

FLIGHT LIEUTENANT R. L. EASTERBROOK, R.A.F.: Can the Lecturer say whether, in his view, there is any future for the pure jet—the ram jet?

THE LECTURER: There is a lot of work being done in America on the ram jet, but the trouble is its inflexibility and very high fuel consumption. I think it can and will be used as an accelerator for aircraft where its boosting, for military purposes, might be of value for short periods of a few minutes. I feel, however, that you might do better by the use of "after-burning" or the liquid fuel rocket. Ram jets, if fitted externally, as they must generally be, will put up the aircraft "drag" appreciably, thus detracting somewhat from their thrust.

GROUP CAPTAIN DENIS I. COOTE, R.A.F.: It may be possible I have been misinformed, but I have heard that the selling of jet engines to Russia has not done us much harm because the metallurgical problems which arise in building these engines are more than the Russians could cope with at present, and therefore they are not able to build jet engines which would stand up to service; they could only produce inefficient copies of what they have bought. Yet this does not seem to be borne out in actual practice. When we read accounts of Russian aircraft we read of all the different types of jets which they have. How far have they got with their jet production?

THE LECTURER: You have asked me a difficult question and I do not think anyone knows the real answer. All I can say is that one should never under-estimate one's competitor. My own personal opinion is that they are not up to our standards on a metallurgical or a design basis; but apparently, they have built aircraft with jet engines of their own in addition to those delivered by us. Probably they have built some like the German B.M.W. jet engine, because they had its designs and they have some of the German technicians over there, too. The B.M.W. is not as good an engine as anything we can produce; but it works.

SQUADRON LEADER H. JACOB, R.A.F.: Could the Lecturer say a word or two on the vulnerability of jet engines, comparing them with piston engines?

THE LECTURER: From the military point of view I have got to take it that one will probably have a fairly low flash-point fuel. Apart from this, if you hit a jet engine in the combustion chambers I should think that you would have a catastrophic fire and, therefore, it would be necessary to armour around these. I think the engine lends itself to fairly easy armouring. If you did puncture the combustion chambers at the guide vane end of the chamber, near to the turbine, you would get a pretty good fire. I think you would have to armour in certain belts, such as the chambers and turbine wheel, and let the jet pipe take care of itself.

WING COMMANDER K. S. BATCHELOR, R.A.F.: Is there likely to be any appreciable decrease in the fuel consumption of jet engines during the next five years?

THE LECTURER: I have said in the lecture that, in the next five years, there is no reason why the consumption could not be reduced to about 0.9 lb. of fuel per 1 lb. of static thrust per hour—from the present 1 lb./per lb. thrust/per hour. You have to be careful about this, however, because the jet engine's overall fuel economy is bound up with the propulsive efficiency of the jet. If you brought out an engine that gave 0.9 lb./per lb. thrust/per hour tomorrow and put it in some of the present-day aircraft you might be wasting your time; since an engine designed for this specific consumption might be somewhat heavier than the present types, and the aircraft might be too limited in Mach No. to take advantage of the increased jet velocity and, therefore, the propulsive efficiency would suffer and fuel would be eaten up to no purpose.

SQUADRON LEADER H. F. KING, R.A.F.: Is it possible to adapt the present turbine jets for supersonic operation, or will it be a major re-design?

THE LECTURER: Yes; there is no reason why the present jet engines cannot be used in the supersonic aeroplane. While there is oxygen available the engine will run and give the necessary output. It depends, however, whether or not such military aircraft will be required to operate continuously at supersonic speeds. If they do, then, to get any range at all, it will be necessary to build an engine of sufficient size and economy to do the job. If, however, only short "boosted" periods of minutes are required, then a smaller engine could be used and "after-burning" or liquid fuel rockets employed to "boost" to super-sonic speed.

GROUP CAPTAIN C. G. LOTT, R.A.F.: Is it true to say that the designer is ahead of the metallurgist, or is the metallurgist meeting the designer's requirements?

THE LECTURER: It is difficult to give a fair reply because the materials people and, in particular, the Mond Nickel Company, made such an excellent effort in giving us very good materials even in the early development of the engine. But it is true to say that we could take advantage of still better materials at this moment, although I think we have to realize that there must obviously be a limit in the case of metallic materials because the elements used in these all melt at around 1400° C.; therefore there must be a flattening curve of progress in the development of such high temperature materials, which may peak for practical purposes at a maximum of 900° C. when operating in the engine.

I think there is a great field of development offered in ceramics and the ceramic coating of present materials. There is also the question of blade cooling by air or some other fluid. All these will allow higher operating temperatures which will improve turbine efficiency, particularly the efficiency of the propeller turbine.

WING COMMANDER C. ROWAN-ROBINSON, R.A.F.: Are there many problems in operating jet engines in desert regions? I refer to the amount of sand there frequently is in the air.

THE LECTURER: It will be impracticable to filter the air for the jet engine. But I think, in the case of the present straight-through combustion chamber design, the engine should be able to pass a lot of sand or dust without harm. We once fed a considerable quantity of sand into one of the older engines where there were a number of corners or nooks in the combustion chambers and flame tubes; and, where the sand piled up in these, quite a nice amount of glass was manufactured!

CAPTAIN E. ALTHAM, R.N.: We have heard from one or two lecturers lately of the increasing future for air transport for landing assault troops—perhaps as the spearhead of quite a big invasion, and the probability of their taking over to a considerable extent what was done in the last war by sea. Should we be right in thinking that, despite the obviously increasing rivalry of the gas-turbine type of engine, we shall still require the slower piston engine type of aircraft, perhaps in considerable numbers, for dropping paratroops or towing gliders.

THE LECTURER: That is a fair question. I think, if you take the ten or fifteen years period which I have considered in this lecture, piston engines will still be used for the type

of work you mention; because, for one thing, the prototype aircraft which will be built and developed in the next ten or fifteen years are bound to be very advanced turbine types, which will demand all possible effort to make them useful for military purposes; and there will probably be insufficient effort to spare in this Country to develop a particular turbine for the slower transport types. Therefore the present piston engines, of between 2,000 and 3,000 b.h.p., should still be in use then.

For very short ranges of 200 miles or thereabouts, a jet type transport could double the turn-round time of the equivalent piston-engined aircraft, and might pay in getting equipment delivered in quick time, despite its higher fuel consumption at what would obviously be relatively low altitude operation. Accelerators of the Jato type could be used to get such aircraft off the ground in a short run.

The propeller turbine, which is now being developed for civil type machines, might eventually be used for the faster military transports, for carrying and landing troops and equipment; although if these could be dropped by parachute, then the jet aircraft might show to advantage for ranges somewhat shorter than those offered by the propeller turbine; it might do the job much more quickly and, therefore, be less vulnerable. I cannot see the piston engine being completely displaced for this class of work.

THE CHAIRMAN

I think Air Commodore Banks has given us an extremely useful lecture. Really the great point that we get from it is the fact that for aircraft of extreme performance, both in fighters and in bombers, the gas turbine now and in the future will continue to hold its own, and eventually be alone in the field. I suppose that I am right in saying that the faster we demand the aeroplane to go, the more completely the swing will be over to the pure jet aircraft. The Lecturer mentioned the ducted fan, and I suppose the ducted fan to-day has not come into its own, due to the fact that the speeds already have overtaken it. I feel that the propeller gas turbine may one day go the same way. It will eventually die out except for long-range transport purposes, where it may still hold its own.

Another point I thought extremely interesting was the question of transport aeroplanes for assault use. Talking with the responsibilities which I hold, I feel that there can be no question of all aeroplanes going over to gas turbines. The Lecturer has mentioned the materials required, and that alone, I am certain—the shortage of those materials—will demand that we keep our gas turbines for those aircraft which must have the very extreme performance.

The next point I would like to emphasize is the development time. I feel that the turbine has really arrived just in time, because with the development of the piston engine—I am sure the Lecturer would not disagree—if we had had to go further, I am certain that we would never have seen a new piston engine developed in the five years cycle which he mentioned for gas turbines. Further, I fear that should gas turbine propellers or piston engines of higher powers be required, the development of suitable propellers will be a formidable task.

I would like to thank Air Commodore Banks not only for myself but for you all for the very excellent lecture he has given.

The customary votes of thanks to the Lecturer and Chairman were carried by acclamation.

FIFTY YEARS OF WARSHIPS

By "NAVARINO"

FIFTY years ago a young journalist, blessed with unusual aptitude for assimilating knowledge of the Navy and initiative in its application, compiled the first *All the World's Fighting Ships*. In order to appreciate fully all we owe to the late Mr. Fred T. Jane, we should look through the whole series from his earliest productions up to the latest edition for which his worthy successor—Mr. McMurtrie—has again been responsible. But for the majority who have not got access to such archives, *Jane's Fighting Ships* 1947–48[1] includes a potted history of half a century of "The World's Ironclads" in the form of silhouettes of the principal types between then and now. These alone are an invitation to study in more detail the changes in men-of-war and their armaments and to trace how they have influenced sea warfare.

Although the great metamorphosis from wood to iron and from sail to steam was practically complete by 1897, developments in the construction and fighting equipment of ships in the next fifty years were to be no less great and vital, while submarines and aircraft-carriers had still to find a place in the *Annual*.

The earliest editions of *Jane* list a number of ships which were still links with the past—many built of iron before steel had entirely superseded it, some still carrying masts and sails, a few with their main armament mounted to fire on the broadside from box-batteries. These were relics of the days when 1,000 yards was a long range for gunnery, when the torpedo was an unreliable weapon even at a few hundred yards, and when few battleships were good for 14 knots, first class cruisers for very little more, and second class cruisers for only 16 to 17 knots.

But this was merely the old tail of the Navy. A new all-steel fleet, including battleships with pairs of 12 in. guns in centre-line turrets and with a maximum speed of 17 to 18 knots; armoured cruisers with a couple of long 9.2's and twelve 6 in. Q.F's, good for 21 to 22 knots; and the famous "30 knotter" destroyers, is also to be found in this early catalogue. Yet, before the fifty years are out, nearly all those noble vessels pass from these pages as they are relegated to the scrap-heap. Many of them saw service in the 1914–18 War and demonstrated that ships which are wont to be written off as "obsolete" often have a lot of fighting value left in them and may prove invaluable for tasks for which new construction can be neither spared nor risked [2]

BATTLESHIPS

It is an intriguing pursuit to trace the changes in battleship design from, say, the "Hercules" of 1868 (but still on the active list until 1902) to the greatest warship ever built—the Japanese "Yamato" and her sister ship, the "Musashi," described in the latest *Jane*. Let us select some typical stepping stones and see how the toughest, hardest-hitting surface ship man could devise has evolved during the past half century:—

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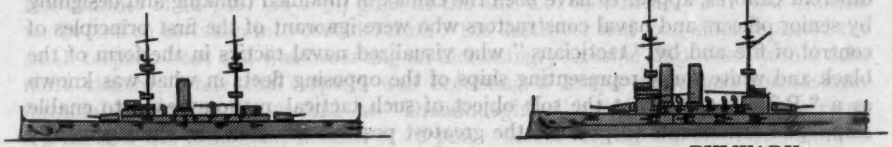
[1] *Jane's Fighting Ships* 1947–48 (founded in 1897 by Fred T. Jane). Edited by Francis E. McMurtrie, A.I.N.A. (Sampson Low, Marston & Co.) 63s.

[2] See "The Value of Obsolete Warships and Weapons" by Commander W. B. Rowbotham, R.N., in the JOURNAL for May, 1934, p. 295.

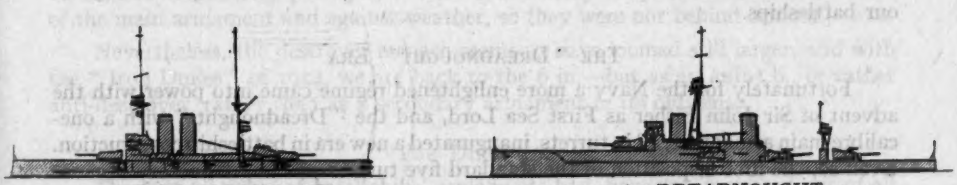
Name or Class	*Year of Completion*	*Displacement in tons*	*Main Armament*	*Maximum Speed in Knots*	*Remarks*
"Hercules"	1868	8,680	Eight 10 in. (M.) Two 9 in. (M.) Eight 6 in. Four torpedo tubes (A.W.)	15	Iron ship. M = muzzle loaders. A.W. = above-water.
"Inflexible"	1881	11,880	Four 16 in. (M.) Eight 4.7 in. Four torpedo tubes (two subd.).	13.8	Iron ship. Originally brig-rigged. 2 centre-line turrets amidships. subd. = underwater.
"Trafalgar"	1887	12,530	Four 13.5 in. Six 6 in. Four torpedo tubes (two subd.)	17	Steel ship. Military masts. 2 centre-line 13.5 in. turrets; one forward, one aft. 6 in. in battery amidships.
"Majestic"	1895	14,900	Four 12 in. Twelve 6 in. Five torpedo tubes (four subd.).	18.5	Similar disposition of armament but 6 in. in casemates.
"Bulwark"	1900	15,000	Do.	18	Do.
"King Edward" ...	1905	17,500	Four 12 in. Four 9.2 in. Four 6 in. Twelve 12 pdr. Five torpedo tubes (subd.).	18.9	Pair 12 in. turrets on centre line. Single 9.2 in. turrets; two on bows, two on quarter. 6 in. in Main Deck casemates.
"Dreadnought" ...	1906	20,700	Ten 12 in. Ten 12 pdr. (18 cwt.). Five torpedo tubes (subd.).	Over 20 kts.	See description and remarks in text.
"Thunderer" ...	1912	25,000	Ten 13.5 in. Sixteen 4 in. Two torpedo tubes (subd.).	Over 21 kts.	Do.
"Queen Elizabeth"...	1915	33,000	Eight 15 in. Twelve 6 in. Four torpedo tubes (subd.).	25	Do.
"King George V" ...	1940	44,650	Ten 14 in. Sixteen 5.25 in. (No torpedo tubes.)	Over 28 kts.	Do.
"Yamato" (Japanese)	1941	72,809	Nine 18.1 in. Six 6.1 in. Twelve 5 in. A.A.	27	Do.

The chief *raison d'etre* of the battleship is, and always has been, of course, to provide a well-protected mobile platform for an armament of heavy guns sufficiently powerful to sink any similar or lesser ship of the enemy. The old broadside armament

1868. HERCULES (As refitted 1892) 1881. INFLEXIBLE 1887. TRAFALGAR



1895. MAJESTIC 1900. BULWARK



1905. KING EDWARD VII 1906. DREADNOUGHT

1912. THUNDERER

1915. QUEEN ELIZABETH (As reconstructed 1926)

1940. KING GEORGE V

1941. YAMATO

TYPES OF BATTLESHIPS DURING FIFTY YEARS

(Dates are those of completion)

of many guns—a relic of sailing-ship days, died hard; but was eventually superseded —so far as the heaviest guns were concerned—by the revolving platform in a barbette or turret, capable of being trained on either beam. At first these were limited to two per ship—as in the old " Inflexible "—or even one—as in the " Sans Pareil "—and it was not until the " King Edward's " were built in 1905 that secondary turrets (9.2 in.), which could only bear on one broadside, were added to the standard pair of centre-line 12 in. turrets. Those ships, with their hotch-potch of guns of many different calibres, appear to have been the climax of muddled thinking and designing by senior officers and naval constructors who were ignorant of the first principles of control of fire and by " tacticians " who visualized naval tactics in the form of the black and white slugs, representing ships of the opposing fleets in what was known as a " P.Z. Plot."[1] That the sole object of such tactical manœuvres is to enable ships' gun armaments to produce the greatest possible fire effect was not generally realized or accepted by those senior officers who were still influencing the design of our battleships.

The " Dreadnought " Era

Fortunately for the Navy a more enlightened régime came into power with the advent of Sir John Fisher as First Sea Lord, and the " Dreadnought " with a one-calibre main armament, all in turrets, inaugurated a new era in battleship construction. Even so, the first disposition of the standard five turrets was unsatisfactory because only four could fire on one broadside. This was partially rectified in the " Neptune," completed in 1909; but it was not until the 13.5 in. gun was introduced in the " Thunderer " class of 1910 that a full " A " arc of ten guns in pairs in centre-line turrets could be fired. This arrangement of the main armament had come to stay, although the number of guns in each turret varied from the traditional two, to three in the " Nelson's " of 1925, and four in two of the three turrets of the " King George V's " of 1940. The " Yamato's " massive armament of nine 18.1 in. guns was distributed in three triple turrets, all on the centre line.

The secondary armament of battleships has undergone many alterations during the past half century, largely due to the changing conditions it was required to meet, but also to the lack of any well-defined policy, based on technical knowledge, on the part of those responsible for designing it. Originally, it would seem, the idea was that a battery of more rapid-loading secondary pieces would keep the fire effect going while the cumbersome main armament was trained fore and aft to reload. It was also regarded as the appropriate armament for night action, for which, it was assumed, the heavier guns would be too slow and their flash too blinding. This need for quick-firing batteries or groups of guns became more insistent with the development of torpedo craft. But for many years there appeared to be no clear conception of what was the best anti-torpedo-boat armament, as it was called; so we find the 12 pdr. and even 3 and 6 pdrs. supplementing the 6 in. secondary armaments of battleships and adding to the chaos of night-firing in the days when neither guns nor searchlights had any effective system of laying or control.

Looking back on the unsuitability of these armaments, the inefficiency of the whole anti-t.b. organization and the cavernous compartments devoted to submerged torpedo tubes, one can only be thankful that the battleships of that time were never the targets for massed torpedo attacks: they were poorly equipped to fend off their

[1] The plotted positions at regular time intervals of ships in the opposing forces engaged in a mock battle.

arch-enemy—the destroyer, and certainly very vulnerable below the belt. If they had been caught at night in seas where hostile torpedo-craft could operate, the mortality in the major units of the Navy would certainly have been great.

However, here again enlightenment came, and in the " Dreadnought " we find simplification of the anti-t.b., as of the main armament. The old " secondary " battery, which had become neither fish, flesh, fowl nor good red herring, disappeared and we see a policy which produced ten 12 in.—essentially for day action—and a like number of 12 pdr. (18 cwt.) guns as the anti-t.b. armament. But now another factor had to be taken into consideration : the destroyer had long since replaced the small torpedo-boat and was becoming an increasingly sizeable ship which would take more sinking, while the torpedo was becoming a longer-range and increasingly formidable weapon. So we find the " Dreadnought's " immediate successors carrying a 4 in. anti-t.b. armament instead of 12 pdrs. Moreover, the former were mounted on the old box-battery principle, but this was mainly for protection from the blast of the main armament and against weather, so they were not behind armour.

Nevertheless, the destroyer menace seems to have loomed still larger, and with the " Iron Dukes " of 1914, we are back to the 6 in.—but as an anti-t.b., or rather anti-destroyer, rather than as a secondary armament in its old sense.

The Director

The tactical value of battleships' armaments had, however, increased out of all proportion to the size of the guns by now. This was not only due to the great improvements in the technique of range-finding and keeping, but especially to the introduction of a really efficient system for laying guns under action conditions, in the shape of the master sight or Director, as it was called. This principle—dating back to sailing-ship days, but for long discarded—reappeared in a modern and really efficient form in the " Thunderer " in 1912. Mercifully, its worth was proved in time for all the battleships in the Grand Fleet to be equipped with it before the battle of Jutland ; furthermore, it solved the greatest problem of using the anti-destroyer armaments effectively, especially at night.

So we come to the between-war years. Owing to the limitations imposed by the Washington Treaty and to financial restrictions, only two new battleships were built for the British Navy during the twenty years between the Wars ; these were those good but ungainly ships, the " Nelson's." It is interesting to note the similarity in the broad features of design between these products of 1927 and those of the " Sans Pareil " of forty years earlier—the same very long forecastle on which is concentrated the main armament, and the compression of the lesser pieces into the after part of the ship. They both give the impression that the over-riding principle was that they should be at their best for engaging a'beam and well equipped for pursuing a reluctant enemy, but that there could be no thought of their ever having to run away, although the older ship did have a " stern-chaser " in the shape of a single 10 in.

The New Enemy

A new enemy had, however, begun to make its appearance and one which was to affect vitally the whole situation for surface warships—the aeroplane. The 1919 *Jane* shows that, in the course of the 1914–18 War, our battleships and battle-cruisers acquired a modest A.A. armament of two 3 in. A.A. guns each. Turning to the 1947–48 edition, we find the " King George V " with sixteen 5.25 in. high elevation and no less than 64 to 88 2 pdr. A.A. pieces to say nothing of a multitude of Bofors and

Oerlikons. The lastest American battleships carry an A.A. armament of twenty 5 in., eighty 40 mm., and fifty 20 mm. guns. The " Yamato " carried six 6.1 in. guns capable of high elevation, twelve 5 in. and " a great many " smaller A.A. guns. Moreover, the guns of all the more modern battleships' main armaments have been given elevation which enables them to be used as long-range A.A. weapons. The latest *Jane* refers specifically to the " Yamato " having " fused anti-aircraft projectiles for the 18.1 in. guns." All this additional and special armament, and the increasing use of horizontal armour, are evidence of the battleship's efforts to compete with the latest and the greatest menace to her very existence she has had to face in the whole course of her history.

The Future of the Battleship

For years there have been self-appointed critics who have pronounced that the battleship's day is done; soon after the 1914–18 War a well-known Admiral was advocating that we should " scrap the lot." The loss of H.M.S. " Prince of Wales " and of the battle-cruiser " Repulse " by a concentrated aircraft attack, and even more impressive, the similar fate of the greatest battleships ever built, will certainly be used to support the claim that the so-called capital ship has no *raison d'etre* in modern sea warfare. Against that, we have the facts that in the whole course of the heaviest and most prolonged sea/air warfare in the Pacific, the U.S. Navy did not lose a single battleship, if we ignore the treacherous attack on Pearl Harbour; it was Kinkaid's battleships mainly which saved the landing in Leyte from disaster on the night of 25th October, 1944; and the President of the U.S. Naval War College, in reply to a question put to him in the Institution's theatre in 1946 as to whether he thought there was any future for the battleship, replied " I most certainly do."

That the battleship of the future will be as different from the battleship of the past, as the " Vanguard " is from the " Hercules " of fifty years ago, must be expected; but there will always be a type of surface ship which is the toughest, hardest-hitting of them all, and call her what we like, she will, in effect, be a " battleship."

BATTLE CRUISERS

The first battle cruisers in any navy were the British " Invincible " class, which made their appearance in *Jane* of 1907. These were contemporaries of the earlier " Dreadnoughts " which they somewhat resembled as regards their main armament—herein, as will be seen, lay a danger. These were ships of about 18,000 tons and 25 knots speed. To obtain the latter, they sacrificed one 12 in. turret and a lot of armour, as compared with the battleships. The four turrets were disposed, two on the centre-line, (fore and aft), and the others in echelon (port bow and starboard quarter) with very limited arcs of fire across the deck.

The " Lion " class were the contemporaries of the " Thunderer's " with eight 13.5's, all in pairs on the centre line. They, too, were very lightly armoured and huge targets.

There followed the " Tiger," better armoured and with a secondary armament of twelve 6 in. instead of the " Lion's " sixteen 4 in. guns.

The two " Renowns " came along in 1916 with three twin 15 in. turrets, and British battle-cruiser design culminated in the handsome " Hood " of 45,000 tons, mounting four twin 15 in. turrets, having a speed of 31 knots, and fairly stout main vertical armour but, alas, inadequate horizontal protection.

The battle-cruiser, as a class, is still to be found in the latest *Jane* in the United States section, where we find the three " Alaska's " of 32,000 tons, carrying a main

armament of nine 12 in. guns in three triple turrets and with a speed of 33 knots ; the armour is of cruiser standard only.[1]

So far as the British Navy is concerned, the battle-cruiser has proved one of the least successful of warship designs, and it is unlikely to be repeated. Fast, heavily armed but lightly armoured, they were originally intended by their progenitors to dominate the cruiser line—the eyes of the battle fleet before the days of aircraft ; under favourable circumstances they might harass the head of the enemy battle line. They were never meant to fight duels with battleships ; yet they did so at Jutland, with the result that three out of nine were sunk, and again when the " Hood " engaged the " Bismarck " in 1941 and was sunk.

In both cases the temptation to use the ships' long-range heavy guns to engage the enemy in sight must have been overwhelming ; indeed, not to have done so would doubtless have brought considerable odium on the Admirals concerned ; but tactically and technically there is no evading the fact that this was a case of misuse of inappropriate force.

Their one historic success was, of course, the Battle of the Falkland Isles in 1914, when the " Invincible " and " Inflexible " headed a British squadron which sank the German armoured cruisers " Scharnhorst " and " Gneisnau " and two light cruisers.

THE CRUISER

The cruiser, as she is to-day, has become far more standardized than she was fifty years ago. In 1897 we find the Armoured Cruiser, the Protected Cruiser, 1st, 2nd and 3rd Class Cruisers, and even the Ram-Cruiser. Even in the late war there were Heavy Cruisers (usually with 8 in. guns), Light Cruisers (usually with 6 in. guns), and A.A. Cruisers—converted older ships. Now we notice that in the British section of the Annual all are classified as, simply, " Cruisers."

The newer and bigger ships have a standard armament of nine 6 in. guns—all, be it noted, mounted in turrets on the centre line on the same principle as battleships' armament. For some queer reason, cruiser design lagged behind battleship design in this latter respect, and we find cruiser contemporaries of the " Dreadnought " era still mounting the greater number of their guns on the broadside. It was not until December, 1914, when the first of the " C " Class was completed, that we see a one-calibre main armament of 6 in. guns all mounted on the centre line. The heavier " Hawkins " Class, not completed until after the 1914–18 War, were a compromise in that five of their single 7.5 in. turrets were on the centre line but two more were mounted, one on each broadside, but with a wide arc of training to the bow.

The 10,000 ton post-Washington Treaty "County" class came in for a good deal of criticism when they began to appear in 1928 because of their poor armour, inferior speed as compared with some foreign contemporaries, and because they were such large targets. The earlier ships reconstructed in 1935–38 were given improved protection and some of the later of these " heavy " cruisers were considerably modified just before or during the 1939–45 War. On the whole, they gave a good account of themselves and from a gunnery point of view, these ships with their eight 8 in. guns in twin turrets, all on the centre-line and with a maximum elevation of over 60°, were more successful than was expected.

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[1] The third ship—the " Hawaii " is still building. Completion is held up pending the development of a main armament of rocket projectors.

The latest example of British cruisers, as typified by H.M.S. " Superb," continues the now well-established policy of a centre-line main armament of nine 6 in. guns in three triple turrets and a powerful A.A. armament of ten 4 in. and numerous smaller guns. The torpedo armament has been increased from six, in the immediate preceeding classes, to eight 21 in. above-water tubes. Maximum speed is 31.5 knots.

None of our cruisers now carries any aircraft. Their latest contemporaries in the U.S. Navy, on the other hand, continue to do so. Which is the right policy is arguable, but it is interesting to note that the Navy Department—which is certainly very air-minded, has adhered to a practice which the Admiralty discarded during the War.

Cruisers, as a type, have lost much of their value as " eyes " for the fleet with the advent of the aircraft carrier and the great development in the range and reliability of aircraft ; but, with the drastic reduction in the number of battleships now kept in commission, they share with the carriers the status of the main components of modern fleets, and as such have fully retained their importance. For peace-time policing, the large cruiser with her trim and imposing appearance and relatively large complement, is probably as ideal to-day as she has been in the past.

THE AIRCRAFT-CARRIER

A type of warship destined to change the whole conduct of sea warfare first appeared in embryo form, when the old cruiser " Hermes " was fitted out in 1913 as a parent ship for seaplanes. In 1914, H.M.S. " Ark Royal " was purchased from the Blyth Shipbuilding Company and adapted, in a rather Heath-Robinson fashion, as a kite-balloon ship and seaplane carrier. Her primitive equipment included a couple of dock-side steam cranes, complete with vertical boilers. She did good work in the Dardannelles and her appropriate name seems likely to be borne by a number of descendants.

She was followed by six cross-Channel steamers of the type of the " Engadine." These had flying-off decks, and it was the pilot of a seaplane from that ship who sighted the enemy fleet at Jutland ; but of so little account were aircraft in those days that no ship in the Grand Fleet took any notice of his signal.

The first fully-fledged aircraft carrier was the " Furious." Completed in 1917 as a large " light cruiser " carrying two 18 in. guns, she was deprived of her main armament and underwent a number of extensive and expensive alterations to emerge ultimately as a " clear-top " carrier with horizontal funnel ducts and a landing-on-deck running nearly the whole length of the ship. Two slightly smaller ships of a similar class—the " Courageous " and " Glorious," were also converted to carriers, but with an " island " structure for funnel, mast and bridges to starboard. Both these latter were lost in the War ; but the veteran " Furious " survived much active service.

At one time there was some controversy as to whether the " island " or the " clear top " type of carrier was best ; eventually the former won and was adopted in both the British and American Navies ; the Japanese preferred the " clear top " type.

The first ship to be designed for (as distinct from being converted to) an aircraft-carrier was a new " Hermes " of 12,900 tons, completed in 1924. Experience was soon to show that as aircraft developed in size and speed—and incidentally range and equipment—much larger carriers would be required. Already a ship of over double

the displacement of the " Hermes "—H.M.S. " Eagle " (built up from the beginnings of the Chilean battleship " Almirante Cochrane ")—was in commission and proving her worth. The U.S. Navy, not wont to do things by halves, had converted two partially built battle cruisers into the giant carriers " Lexington " and " Saratoga." Displacing about 40,000 tons, they could carry nearly a hundred aircraft, mounted eight 8 in. and twelve 5 in. A.A. guns and had a speed of over 33 knots.

Originally, the carrier was regarded as very much the auxiliary of the battleship and even took second place to the cruiser as the provider of " eyes " for the fleet. But the late War has changed all that, and she has become the most important class of warship: her torpedo-bombers have replaced the battleships' guns as the Navy's long-range weapons, and her reconnaissance aircraft have superseded the cruisers in what was one of the latter's primary roles. Because she is now so invaluable—she has naturally become, also, the most worth-while target for counter attack, especially by enemy aircraft; so instead of the flying deck resting on what was little more than a weather-proof hangar, it is now the top of a huge armoured box. *Jane* gives no details of the thickness of this armour in the case of the latest British and American carriers; but the way in which they have withstood *kamikaze* attacks is an indication that they are no longer the fragile and vulnerable ships which, at one time, it was conceived they would always be.

A note on the first carrier page of the U.S. Navy in the 1947–48 *Jane* confirms the details of the World's largest projected carrier already published in the Journal. She will be a 65,000 ton ship, capable of carrying 24 fifty-ton four-engine bombers. These, according to an American report, could be armed with atom bombs.

So far we have discussed the carrier as the major unit of the main fleet or of a " task force "; but the fact must not be overlooked that, in a smaller form, she has also become the indispensable escort of the merchant ship. Both the British and American Navies used escort carriers—nearly all built in America—extensively for this purpose, and in any future war will doubtless do so again. Here, again, we may see the carrier increasingly displacing the cruiser; but this does not mean that she can do the job of convoy protection alone. The smaller surface ship with gun and anti-submarine armaments will still be needed to form, with the carrier, a well-balanced escort force.

DESTROYERS

Fifty years have seen the destroyer grow from little more than a torpedo-boat of some 250 tons, armed with a couple of single 18 in. tubes and a few 6 pdrs., to the " Battle " class of nearly 2,000 tons, carrying ten 21 in. (quintuple) tubes, four 4 in. and six 40 mm. A.A. guns. Speed has not increased so spectacularly in British destroyers, the 27 to 30 knots of the earliest types having become 34 knots in the latest; but sea-keeping qualities and with them speed in rough weather have improved out of all recognition.

The U.S. Navy has gone in for still larger destroyers, and the latest particulars given are of 103 vessels of the " Gearing " class of 2,400 tons (over 3,000 tons fully loaded), carrying the same torpedo armament as the British destroyers, but a much more powerful gun armament—six 5 in., twelve to sixteen 40 mm. A.A., and four to eleven 20 mm. A.A. Speed is given as 35 knots.

While our two Navies have been content with these relatively moderate speeds, the French and Italian Navies vied with each other during the between-war years in

producing the fastest destroyers afloat. The record went to the French " Le Terrible " of over 3,000 tons displacement, which reached a speed of 45.25 knots on trials and averaged 43 knots on an eight hours' run. Italian destroyers have also been credited with over 40 knots on trials. There is, however, some suspicion that in both cases the ships were built for speed rather than endurance and that they were running light when they made these records.

SUBMARINES

Submarines share with aircraft (and so with carriers) the doubtful honour of having revolutionized sea warfare ; but whereas aircraft only made their influence felt seriously in the 1939–45 War, submarines had proved their importance a quarter of a century earlier and the antidotes were to some extent known and prepared when war came again.

Jane chronicles submarines first in the 1909 edition, when the British flotilla consisted of Hollands (American type) already eight or nine years old, but never more than experimental craft ; and the " A," " B," " C " and " D " class. Of the " A " class, we find it recorded that their submerged displacement was 180–200 tons ; surface speed 11 knots and submerged speed 7 knots. They had two bow tubes. The periscopes were short and the conning towers high. Although greatly superior to the Hollands, they are stated to have been " unsafe over designed speed." The " B's " were " greatly improved ' A's ' " and " very useful boats." " C's " and " D's " were a 100 tons larger and a couple of knots faster.

Turning to Foreign Navies, we find U.S. submarines—all with names, but not appreciably in advance of the British. Japan, Italy, Austro-Hungary and Russia have also made a start with under-water craft. France, at this date, had submersibles (so-called sea-going submarines) and harbour defence submarines. The former are historically interesting on account of their surface engines which were steam driven ; the flash boilers being fired with heavy petroleum. A defect was that they took 12 minutes to submerge, with the steam machinery still giving out " extremely inconvenient heat."

What a change the intervening years have brought about ! The new British " A " class, some details of which are given in the 1947–48 *Jane*, are craft of over a 1,000 tons surface and 1,620 tons submerged displacement. They have ten 21 in. torpedo tubes ; a 4 in. and several smaller guns ; a speed of 18 knots on the surface and 8 knots submerged. They are all equipped with the *schnorkel*—the device fitted in the newest U-boats to enable them to remain submerged for long periods while using their surface propelling machinery. American submarine design is no less advanced.

These types by no means represent the last word in the development of under-water craft. Russia is known to be building a large number of submarines which will embody the latest improvements devised for U-boats when the War ended, and has pressed into service German technicians and designers whose experience is second to none.

It would be very unsafe to assume that because we had pretty well got the measure of the U-boat when hostilities ended, that we shall be in a position to meet any submarine menace in a future war ; rather should it be assumed that, because of new developments, that menace will be as great as it was in the earlier years of each of the last two wars ; and a new technique will be required to counter a new and yet more formidable form of under-water warfare.

AUXILIARIES

Space will not permit any detailed mention of the host of auxiliaries which have grown round main fleets during the past fifty years. Minelayers and minesweepers, repair ships, store ships and hospital ships are long-standing units, but landing and assault ships and craft of all kinds can no longer be regarded as mere war-time excresences: the days of set-piece battles between great battle fleets are over; but the exercise of sea power in future, as in the past, must include the ability to land armies and their impedimenta in a hostile country. The difference is that, whereas up to the 1914–18 War, this was done in penny packets with extemporized craft, the 1939–45 War proved that it has become a major operation for which specialized construction on a great scale is required. Much of what was used then was hurriedly designed and mass produced. It would be unwise to scrap this auxiliary navy wholesale; but attention should be given to the replacement of it by something better no less than to that of new designs for the larger and more orthodox types of warships.

Reference has already been made to the dangers of recent submarine developments. Here again, the design of what are wont to be classed as Auxiliaries will require the best brains to produce warships of a type which must in future be indispensable units of the permanent fleet.

CONCLUSION

To-day, there is a tendency to regard navies as a back number and battleships as mere bomb-fodder. It is, therefore, more than ever important to realize how warship design has kept in step with progress in weapons and changes in sea warfare. At times, it is true, it has lagged behind requirements. Where this was so it was due to lack of co-operation between the tactician (the Admiral), the specialist (Gunnery, Torpedo and Air) and the designer (Naval Constructor).

The more practical higher education and technical instruction of senior officers' the indoctrination of the Naval Staff through the requisite quota of material specialists, the closer association of the user, the scientist, the designer and the producer are some of the influences which have been and are at work to ensure that naval construction keeps pace with the needs of sea/air warfare.

But, whatever the changes in the mechanics and arts of attack and defence, it is vital that the nation as a whole should realize that the fundamental need is that ships and their loads shall pass safely to and from these shores in wartime, and as a corollary, that they must be protected night and day, in fair weather and foul, from enemies of every kind. That protection can only be provided by a Navy—in the air, on the surface and under water, to intercept and destroy those enemies.

This Jubilee *Jane* is a potent reminder of what fifty years of warship construction have produced, and of the great inheritance handed down to us. It is the culmination of a long series of invaluable volumes, and special tribute must be paid to its present Editor and Publishers. Yet they would be the first to agree that they, as we, owe a great debt to those who have kept it going through the intervening years, and most of all to the founder whose name it bears.

THE FOUNDATIONS OF OUR HOME DEFENCE

By "Mere Mercenéire"

THROUGHOUT the ages Englishmen have regarded it as one of the privileges of a free man to be allowed to take part in the defence of his home, so that in times of danger we have never had any difficulty in filling the ranks of home defence corps, whether it was the trained bands of the spacious days of Good Queen Bess or the "Volunteers" of the Napoleonic era.[1] Many of the units now comprising the Territorial Army are the direct descendants of the old county Yeomanries and Volunteers: at least one—the Honourable Artillery Company, started its existence four hundred years ago as one of the City of London Trained Bands. The fact that service in these forces was voluntary was a source of strength, for it ensured that they were composed only of men ready to make sacrifices—a feature which was reflected in their tremendous enthusiasm. Let us learn from historic experience how to build our new home defence system on a firm voluntary foundation.

The Militia and Volunteers

At the end of every war Parliament has invariably cut the Regular Army to the bone; the Militia was therefore instituted and became the time-honoured means of reinforcement in war. In the South African War, however, the demands for both individual drafts and complete units soon exhausted Militia resources. Mr. Brodrick was quick to realize the value of the Volunteers as a pool of partially trained reinforcements and gladly turned to them; they came forward in large numbers and served in all arms and services. Under the prevailing circumstances their use was both economic and legitimate, for it must be remembered that there was no threat to the homeland; after adequate training they were used as individual reinforcements for Regular and Militia units, while their own Volunteer units stayed in the United Kingdom.

The South African War over, Parliament drastically cut the Regular Army. Lord Haldane, by then Secretary of State for War, looking for a way to offset this reduction, decided to increase the value of the Volunteers for any future war. He therefore converted the Yeomanry and Volunteer regiments into the Territorial Force, which he reorganized and equipped on the lines of the Regular Army, whose second line he intended it to be. Its members, however, still joined voluntarily for home service only, so that before men could be sent abroad they had to sign on again for overseas service. He fully realized this limitation, but relied on their tremendous *esprit de corps* to get them over this obstacle, which it did, for in 1914 whole units volunteered to a man and nearly every Territorial unit went overseas.

When the Regular Army mobilized that year, it was rapidly brought up to war establishment by the Regular Army Reserve, which also provided many reinforcements. In addition, however, there was the Militia, or Special Reserve, to provide further reinforcements. Militiamen did six months initial training at their regimental depots alongside the Regular recruits; after this they remained on the strength of a Militia unit for their period of engagement and were called up for one month's training every year.

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[1] "Another sign of the self-respect and self-reliance of the English common folk was training for military service. It was only during the long period of peace and safety after Waterloo that men began to regard it as part of English liberty not to be trained for defence. In all previous ages the opposite and more rational idea had prevailed." *English Social History* (Trevelyan)

The 1914–18 War

When the 1914–18 War broke out, Lord Kitchener became Secretary of State for War and realized that the partially trained Territorial Force, with its part-time cadre of officers and N.C.O's, was quite incapable of becoming the instrument of our military expansion on a national scale. He therefore, in the face of much adverse criticism, formed " Kitchener's Army " which he based on a Regular cadre.

During that war troops were needed for coast watching and guarding vulnerable points. This was originally the role of the Territorials, but as they were being sent overseas, another home defence force called the Volunteers was raised. This was composed of civilians who took turns on duty to provide a twenty-four hour guard on the coast or vulnerable points near their homes, where their local knowledge was valuable, like the Home Guard twenty-five years later.

In 1919, the politicians were determined once again to reduce the Army, but there was no Kitchener to advise on its reorganization, with the result that the Militia, which had provided so many men in our time of greatest need, was abolished. It faded away, but like the proverbial old soldier, never died, and its units with their Colours, funds and property, still exist, though in name only.

The reorganized Territorial Army became our second and only line after the Regular Army, and was to form the bulk of our Field Force in a major war.

After Munich

After Munich, it was realized that the Territorial Army must be expanded, and in 1939 Mr. Hore-Belisha launched his campaign to " double up and double the Territorials." This appeal, made under threat of war, met with an enthusiastic but uncontrolled response. The Territorial Army quickly doubled its paper strength ; the small permanent instructional staff had to compete with the organization and administration of expansion, so that little training could be done. Units often filled up with a large proportion of key men from industry who, when war did break out, had to be returned to civil life having proved but a liability to their units.

It had gradually become obvious to all parties that if the Army was to fight a major war, we must have National Service and train men properly instead of relying on a part-time voluntary system. Shortly before the 1939–45 War broke out, an Act was passed and men were called up for training in a new Militia.

Under war conditions, we found it quite impracticable to keep Regulars, Territorials, Militia and Supplementary Reservists in separate units—nor was it desirable. Differences in status were therefore abolished and every unit was deemed to be part of the Regular Army, much to the regret of those excellent Territorials who had kept the flag flying through all the bad old days and were proud to wear the " T " on their collars.

After Dunkirk

In 1940, after Dunkirk, we therefore had on paper one Army, but in fact it was a miscellaneous mixture of Regulars, Reservists, Territorials and Militia, all at different stages of training, without cohesion, and completely lacking in all essential equipment, most of which had been abandoned in France. Nor was there any Home Defence Force to help them. It was this Army that was called upon to defend us against the threatened invasion by sea and air.

Many of the older Territorial officers and N.C.O's who had spent the best part of a lifetime, and in some cases a fortune as well, keeping their units going, now found

that they lacked sufficient knowledge to train and command them, particularly where units had to convert to another arm. Regular officers and N.C.O's were therefore drafted in to try and help them. Considerable numbers of these public-spirited Territorials, whose families had perhaps been connected with their regiments for several generations, found themselves replaced, often at very short notice; they left with the feeling that they had been badly let down and were, through no fault of their own, disgraced in the eyes of the Regiment they loved—a bitter pill in reward for their years of voluntary work.

It was at that time that the lack of a volunteer home defence force was so badly felt—those "Volunteers" who should have been ready to watch the less vital areas for paratroop landings or strengthen the Army in the more vital ones had been converted into Territorials in lieu of a Regular field force. Mr. Winston Churchill realized this and made his famous "never surrender" speech to the nation.[2]

The Local Defence Volunteers were immediately raised for the purpose and shortly afterwards converted into the Home Guard, organized under the wing of the County Territorial Associations. This Force gradually took over more and more of the defence of our homeland against air, sea or sabotage attacks, and so released the new Army which had been built up and trained to go overseas to fight and start the victorious movement from Alamein and Algiers to Berlin.

Post-War Policy

The War over, we once more struck what Fortescue would have described as a "period of Parliamentary parsimony." The Home Guard stood down and the glorious Army which we had built up into a superbly equipped efficient fighting machine was released to Class "Z" Reserve (there is finality in the very name). The Regular nucleus was so reduced that we have had to retain National Service to enable us to fulfil even the limited commitments left after the evacuation of India, Burma, Palestine and other countries. In fact, so meagre are our liquid military assets that we have had to send a Guards Brigade from London to reinforce Malaya.

At present the plan is to raise the Territorial Army again on a voluntary basis until it can be gradually filled up on a compulsory basis by National Service men, who are to complete their term of reserve service in it. We saw some of the evils of such a system in 1940; it can only lead to the sacrifice of our willing volunteers again as insufficiently qualified. Meanwhile, have we an adequate Civil Defence organization? We have no Home Guard and are apparently making no use of our one really valuable military asset, a trained reserve of several million men. Can we afford such a state of unpreparedness?

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[2] "Even though large tracts of Europe and many old and famous States have fallen, or may fall, into the grip of the Gestapo and all the odious apparatus of Nazi rule, we shall not flag or fail, we shall go on to the end, we shall fight in France, we shall fight on the seas and oceans, we shall fight with growing confidence and growing strength in the air, we shall defend our island whatever the cost may be, we shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills, we shall never surrender (*Cheers*); and even if, which I do not for a moment believe, this island, or a large part of it, were subjugated and starving, then our Empire beyond the seas, armed and guarded by the British fleet, would carry on the struggle until in God's good time the New World, with all its power and might, steps forth to the rescue and the liberation of the Old."—*Mr. Churchill in the House of Commons, 4th June*, 1940.

Present-day Requirements

We need an Army which can be integrated with the other Services in the Imperial and Western Union defence system. Its components should therefore be :—

A voluntary first line Regular Army to provide for our peace-time overseas commitments, training organization and cadres for all types of auxiliary forces.

A compulsory second line Reserve Army trained and organized to provide a field force and mode of expansion in war. This can be done by reforming the Militia from Class " Z " Reserve now.

A voluntary third line Home Defence Army to fulfil a combined Home and Civil Defence role. The Territorial Army organization suits this role and can be easily readjusted to fit it.

The Regular Army can be brought up to the required strength as soon as the necessary improvements in conditions of service are introduced.

The Militia can be composed of units now in suspended animation, whether Regular, Militia, or Territorial, with a Regular cadre, Reserve officers who have been trained at the R.M.A.S. or O.C.S., and fully trained other rank Regulars, Reservists, and National Service men.

The necessary groups of Class " Z " Reserve could be recalled immediately to bring the Militia up to the size and composition proposed for the Territorial Army Field Force, and further groups could be allocated for subsequent expansion on mobilization. Once the scheme starts functioning, its strength would be maintained by the continual intake of National Service men to serve their period on the Reserve with it and replace the Class " Z " groups who would be gradually released.

In a force of this kind, composed of Reservists fully trained for the arm or corps in which they are serving, there is no necessity for weekly drills and consequent local dispersion like the Territorial Army ; training can be centralized and units based on a regimental depot or similar suitable centre. Men can be called up annually for three weeks' training, if necessary in two periods, and these periods can be staggered by sub-units throughout the year ; thus economizing in permanent staff, accommodation and equipment and eliminating the difficult Summer " peak periods " and consequent industrial dislocation.

The Territorial Army must be the organization under which all forms of Home Defence, whether civil or military, become integrated. The County Territorial Associations already exist and can be adjusted for this purpose. The Territorials and Civil Defence must be welded into a single entity under a Home Defence Command, which must assume responsibility for :—

Anti-Aircraft and Coast Defence.

Defence of towns and vulnerable points.

Anti-paratroop and coast watching patrols.

Mobile relief columns, Light and Heavy Rescue Squads.

Fire fighters, guards and wardens.

Ambulance and First Aid Squads.

There must be no question of divided control between military and civil authorities. Home Defence is a *military* responsibility and the time-honoured role of the Territorials for which, owing to their essentially local character, they are specially

suited. Here the voluntary spirit, local knowledge, and (most important) resources of its members can be put to really economic use. It is a sphere in which they can be given the limited technical or military knowledge necessary for the particular task allotted to them—a task for which therefore they should prove adequate in the hour of trial.

The ranks of the Territorial Army must be filled by both full-time and part-time volunteers, male or female, living in the unit area, who are sufficiently fit and not members of any other service. Cadets of all Services, Ambulance Corps, and Fire Services must be affiliated.

A Military Trinity

The military Trinity here proposed as our National Army is designed to allot those roles to forces or types of individual for which past experience has shown them to be best fitted and so rapidly to build an adequate army not subject to the defects exposed in past wars.

It would leave the Regular Army free for instant action overseas unfettered by any commitments in the United Kingdom.

It would provide a second line field army, with a potentiality for expansion and reinforcement for a major war.

It would give us an economic, vigilant, unified army for home defence against *all* kinds of enemy action, thus securing our base—an army of " Volunteers " who would live on their job and thus always be ready for action in the sphere where they have the greatest incentive to make their supreme effort and sacrifice.

It could not fail to strengthen our foreign policy, thus in turn raising the morale of the whole nation and our will to resist—*the vital factor in war*.

THE BATTLE FOR LEYTE GULF

By Lieut.-Colonel H. E. Fooks, O.B.E.

WHEN the Battle for Leyte Gulf was being fought between the American and Japanese fleets in October, 1944, attention in this Country was mainly focussed on events in Europe, and few people realized that it was the greatest and most momentous battle in naval history—not even excepting Trafalgar, for it cleared the path to the final surrender of Japan within the year, while Nelson's epic victory, although it ended the fear of invasion, only paved the way to Waterloo ten years later. It is only comparatively lately that sufficient information from both sides has been forthcoming to make it clear how much was at issue, how near the Japanese came to upsetting the culmination of the whole vast American plan for winning the War in the Pacific, and how and why in the end they suffered such a devastating defeat.

The details of the strategy which led to the battle, and of the tactics employed in fighting, will no doubt be examined minutely by professional experts for some time to come as providing the most up-to-date experience until, perchance, some new engagement is fought with even more modern sea/air weapons. Meanwhile, the following attempt to present a concise account of the main events and features in simple language may be of service to those who are not disposed to study longer and more comprehensive and technical records.[1]

In order to understand the situation which brought about the battle, it is necessary first to survey briefly the earlier course of the war in the Pacific.

After the attack on Pearl Harbour, the Japanese moved quickly. Their army—the second largest, and their fleet—the third largest in the World, fanned out from Japan: in the North to the Aleutian Islands; in the East to the Marshall and Gilbert Islands; in the South to the Philippines and the Dutch East Indies; in the West towards China, Malaya and Burma. All these places fell into their hands comparatively easily. They based their fleet on Truk—a very strongly defended coral reef in the Caroline Islands, centrally placed to repel an attack from whatever direction it might come. The attack on Pearl Harbour had accounted for the United States Pacific fleet for some time to come. The fall of Singapore, following the naval battle of the Java Sea, had put the remainder of the Allied fleet out of action; so that, with the exception of a few ships which were lucky enough to escape and reach Australian harbours, the Japanese had the Eastern seas to themselves. The main British fleet was so fully occupied in European waters and in the Atlantic that it was no menace to the powerful Japanese fleet in the Pacific.

Japanese strategy had been worked out years before by their General Staff and, when put to the test, the results had come up to expectations, but it was realized that, whatever had been achieved so far, the main United States fleet, unlike that of Great Britain, was not entirely occupied on the other side of the World and would still have to be faced; moreover, as time went on, the damage done by the treacherous attack on Pearl Harbour was being made good: sunken ships had been raised and battered ones repaired. The Japanese realized, too, that the sooner they dealt with

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[1] Publications dealing with the Battle for Leyte Gulf are:

Report on Naval Operations. Admiral E. J. King, U.S.N.
The Battle for Leyte Gulf. C. V. Woodward.
The Japanese at Leyte Gulf; The "Sho" Operation. J. A. Field.

that fleet again and completely smashed it the better; so in June—six months after their first attack, they set out once more to destroy it. But this time the U.S. naval command got wind of the enemy's plan and was prepared. Battle was joined not far from Midway Island when the two fleets were about two hundred miles apart. Aircraft were flown off from carriers by both sides and attacked the opposing ships with bombs and torpedoes. The American naval airmen proved their superiority in this duel, and the Japanese fleet limped back to its base at Truk, having lost four carriers to the Americans' loss of one.

From now on the United States and Allied forces under the command of General MacArthur in the S.W. Pacific and those under Vice-Admiral Ghormley (later succeeded by Vice-Admiral Halsey) in the South Pacific began simultaneous offensives against the Japanese both by land and sea. Bit by bit the Japanese lines began to give ground. The U.S. fleet suffered a slight set-back at Guadalcanal, where they were surprised; but, with this exception, the Japanese were gradually forced to yield their hold not only on the sea but on the land as well. The Allied forces closed in and continued to do so until we come to July, 1944.

By now it was becoming clear that, far from realizing their ambition of winning a victory which would enable the Japanese to dominate the Far East and the Pacific, unless they could stop the two-prong American advance by sea their empire was doomed. It was clear, too, that the next move by the Allies was going to be an attempt to retake the Philippines and, if this succeeded, the situation for Japan would indeed be desperate.

The Japanese navy had already been forced to evacuate Truk in the Caroline Islands, and part of it was now based in the Inland Sea and part on Singapore and Brunei Bay in Borneo. The sea route between Japan and those two bases ran to the West of a chain of islands—the Luchu, Formosa, Luzon in the Philippines, and Borneo, all of which had large aerodromes and landing grounds manned by the Japanese air force; shipping using this route could, therefore, be protected from both air and surface attacks. Munitions were sent by it from Japan to Burma and to the fleet in Singapore, and oil came from Borneo and Sumatra to Japan by the reverse route. (There was no oil-field in Japan and no munition factory in Malaya.) If the Philippines returned to American hands, this vital supply route would be imperilled.

Japan started the War very short of tankers and, by the middle of 1944, three-quarters of those she possessed had been sunk, with the result that the fleet based on home ports had to spend weeks collecting oil before it could move at all, and even then it had to be very careful to conserve its supplies. The air force was in an even worse predicament: they had enough fuel to take the air to fight, but they had not sufficient to train their pilots. These shortcomings had long been known to the American Intelligence Service and, in July, 1944, the carrier-based aircraft of the U.S. Pacific fleet made a number of attacks on the main Japanese air bases in Formosa and Luzon. The result was a great victory for the U.S. naval air forces. They lost aircraft and aircrews, but were in a position to replace their losses. The Japanese lost very many more but were not able to replace their casualties. So heavy were these losses in the case of the Japanese naval air service that fleet carriers could not be given more than 20 per cent. of their flying complement. In the case of the land air forces it was not quite so bad, but it takes much longer to train an airman for naval work than it does to train him for land work only, and the latter is not much use at sea, out of sight of land. Admiral Toyodo, Commander-in-Chief of the Japanese Navy, realized this and had to alter his plans accordingly; he concentrated all his carriers

into one force and left the land-based air forces to protect the Japanese fleet from air attack—a nasty shock for both Services.

Toyodo knew by now that the Americans were preparing to invade the Philippines and he decided that this must be prevented at all costs, even at the risk of sacrificing the Japanese fleet. It was now or never, because the fuel shortage would not allow a second major effort to be made. He was not at all sure that even a naval victory would mean the ultimate defeat of the Allies, but it would at least delay the collapse of the Japanese empire. If it came off, so much the better; if it failed, the Japanese fleet would have come to an honourable end.

Toyodo's plan, which he called the "Sho Plan" ("Sho" meaning victory) had its merits; but unfortunately his subordinates who had to carry it out were not as co-operative and enterprising as he thought they would be. The Japanese Navy at this time included the two greatest battleships in the World—the 72,000 ton "Yamato" and "Musashi," each carrying nine 18.1 in. guns in triple turrets and firing a shell of 3,220 lbs. They had 16 in. armour which was increased to 25 in. on the turrets. There were also seven battleships of from 30,000 to 42,000 tons, two of which had been converted into semi-carriers; also fifteen heavy and seven light cruisers; three large and five light carriers; about sixty destroyers, and a strong force of submarines.

The U.S. Navy in the Pacific was slightly stronger in numbers, especially in carriers; moreover, the latter—unlike those of the enemy—were fully manned and equipped.

Information of the Japanese weakness was cabled to Roosevelt when he was at the Quebec Conference. A quick decision was made which advanced the projected invasion of the Philippines from the original date at the end of December to the last week in October. In fact General MacArthur began to move his army about 15th October. The Sho Plan came into operation about the 18th.

At this time there were two American Fleets in the Pacific: the Third under Admiral Halsey and the Seventh under the command of Vice-Admiral Kinkaid.[2] The Third Fleet included six modern battleships, a strong force of carriers, and a proportion of other types of warships; it was a very strong, fast and well-balanced fleet. Halsey's immediate chief was Admiral Nimitz, whose headquarters were at Pearl Harbour.

The Seventh Fleet was known as MacArthur's private navy, and was commanded by Vice-Admiral Kinkaid. Besides containing all the necessary transports and landing craft required to move a large army, it had an escort of six older battleships. They were not fast—their top speed was 18 knots—and not powerful enough to take on a modern battle fleet; but they were well enough armed for bombarding. His cruisers were of comparable type. He also had an adequate force of destroyers, escort vessels, and what were known as "jeep carriers," i.e., merchant vessels whose decks had been levelled to enable them to act as an aircraft carrier. There were eighteen of these. Kinkaid's job was to land MacArthur's army in the Philippines.

When the landing in Leyte began, Kinkaid arranged his fleet in two arcs around the entrances to the Gulf. The inner arc was composed of his heavy fighting vessels—battleships and cruisers, guarding the landing craft fairly close inshore so that their big guns could help the army by firing on the enemy when required. Outside on the eastern side, about seventy miles away, was the anti-aircraft screen composed of

[2] For detailed list of ships in the Fleets, see Appendix at the end of this article.

the carriers with destroyers and escorts to guard them. The remainder of the destroyers were used to patrol the Gulf.

Outside the carrier arc was the Third Fleet under Admiral Halsey. Nimitz' orders to Halsey are important, and can be summarized as follows :—

1. He was to cover and support the occupation of Leyte by destroying enemy naval and air forces threatening the Philippine area.

2. In case opportunity for destruction of major portions of the enemy's fleet offered or could be created, such destruction was to be his primary task.

3. Necessary measures for detailed co-ordination between the Third Fleet and the forces of South-West Pacific Fleet (Seventh Fleet) were to be arranged by their respective commanders.

In short, he was :

1. To help Kinkaid if the latter was attacked, and to cover the occupation of Leyte.

2. To hunt out and chase the enemy if he got a chance.

3. To co-ordinate his plans with Kinkaid.

Halsey, who commanded the main fleet, was a fine Admiral, but was inclined to be impetuous, hence his nickname " The Bull." His personal inclination was for part 2 of his orders rather than part 1, and, as we shall see, when it came to the point he forgot to tell Kinkaid what he was doing.

THE JAPANESE PLAN

The Japanese appreciation of the situation must have been something like this : We are very short of fuel and of flyers ; our fleet cannot take on the U.S. Pacific fleet and MacArthur's fleet in combination—they are far too strong ; if we can attack MacArthur's fleet off Leyte, we have a good chance of smashing it, provided that Halsey's fleet does not interfere. If MacArthur's fleet can be destroyed he will be in a very bad way. The problem is how to get Halsey out of the way while we attack MacArthur ?

So the Sho Plan was as follows :—

The Carrier Fleet under Vice-Admiral Ozawa—far too short of aircraft and pilots to be of use as a support to the battle fleet—was to be employed as a decoy. Ozawa was to attract Halsey's attention, get him to pursue, and then run him out far into the Pacific away from Leyte ; this might lead to the destruction of Ozawa's fleet, but that could not be helped. Ozawa's fleet was based on the Inland Sea.

The Southern Fleet, based on Singapore and under Vice-Admiral Kurita, strengthened by the Northern Fleet under Vice-Admiral Shima, was to attack Leyte from the East and West simultaneously.

Kurita himself, with the Main Fleet, would pass through the Straits of San Bernardino, then turn South to attack Leyte from the East ; at the same time Vice-Admiral Nishimura (Kurita's second-in-command) with his squadron, assisted by Vice-Admiral Shima's fleet, would attack from the West through the Surigao Strait. The two attacks were to be synchronized to take place at dawn on 25th October. The land-based air forces in Formosa and Luzon were to give all the support they could.

The main object was to destroy MacArthur's fleet.

Ozawa's fleet consisted of the two battleship-carriers, one large and three small carriers, three light cruisers, and eight destroyers.

Kurita's fleet consisted of the two super-battleships and three others, ten 8 in. gun cruisers, two light cruisers, and fifteen destroyers—all modern fast ships; a very strong fleet.

Nishimura had two battleships, one armoured cruiser and four destroyers. Finally Shima, whose job was to support Nishimura, had two 8 in. cruisers, one light cruiser and four destroyers.

On hearing of MacArthur's preparations to move to Leyte, Admiral Toyodo gave orders for the Sho Plan to be put into operation at once.

THE PRELIMINARY MOVEMENTS

On 18th October, Vice-Admiral Kurita, who commanded the Southern—the strongest Fleet, sailed from Singapore. He had orders to detach Nishimura with his squadron at Brunei Bay in Borneo and then to move up to the West side of Palawan, through the Sibuyan Sea, then through the San Bernardino Strait down the East side of Samar and so in to attack at dawn on the 25th.

On the night of the 23rd, Kurita, in the armoured cruiser "Atago," was leading his fleet to the West of Palawan and, unknown to him, was being shadowed by the two U.S. submarines "Darter" and "Dace." These submarines reported his position to Admiral Halsey and, at dawn on the 23rd, they attacked with torpedoes and sank the two 8 in. cruisers "Atago" and "Maya," and severely damaged the "Takao." Luckily for Kurita, his flagship did not sink at once and he was able to transfer his flag to one of his super-battleships, the "Yamato."

About 8.30 a.m. on the 24th Halsey, who now knew where Kurita was, sent off his carrier aircraft to attack him in the Sibuyan Sea. Halsey's orders were: "Strike, repeat Strike, and Good Luck." The aircraft attacked all day long, and Kurita called for air cover but got none, although Ozawa's carrier force, which was now not so far away from him as it moved down from the Inland Sea, tried to distract Halsey's attention. As a result he suffered severely and his super battleship, the "Musashi," was the particular target of the American aircraft; she was repeatedly hit and at 3.30 p.m. rolled over and sank, taking with her some 1,200 officers and men—about half her complement. If the "Musashi" had not proved such an attraction to the U.S. bombers, it is probable that his losses would have been higher.

During the air battle the U.S. flyers reported that they were being attacked by aircraft flying in from the North-East. When Halsey got this news he soon realized that, as there was no land for miles in that direction, these must be carrier-based aircraft, and that the main Japanese fleet, which he knew had carriers, must be somewhere in that direction. He at once sent out an air reconnaissance to find that fleet. He also realized that Kurita was making for San Bernardino Strait and that, if he got through, he would in all probability make for Leyte; so Halsey detailed five fast battleships, two heavy and five light cruisers, and two destroyer squadrons to form a task force, which he designated Task Force 34.[3] It was his intention that

[3] Task Force 34, as originally planned:

VICE-ADMIRAL WILLIS A. LEE

Battleships	*Heavy Cruisers*	*Light Cruisers*
"Washington" (Flagship)	"Wichita"	"Vincennes"
"Iowa"	"New Orleans"	"Miami"
"Alabama"		"Biloxi"
"South Dakota"	*Destroyers*	"Santa Fè"
"Massachusetts"	18	"Mobile"

this force should be available for a special job, and it was obvious to everyone that this job would be to stop Kurita if he reached the eastern end of the San Bernardino Strait. The wireless signal to this Force, although not addressed to them, was picked up both by Nimitz at Pearl Harbour and by Kinkaid at Leyte.

Later on in the afternoon of the 24th, Kurita found that his ships, in trying to avoid the constant air attacks, had become very scattered. He decided to turn round and steam West for a few hours in the hope that this would throw off the air attacks and also allow him to reform his fleet ; then he could resume the original course. He reported what he was doing to Toyodo and steered to the westward for two hours, after which he turned back to his original course. Toyodo, thinking he had cold feet, sent him the signal, " Advance counting on divine assistance " ; but Kurita had been back on his easterly course for some time when he received it. He never had the slightest intention of retreating.

About the time that Kurita turned to the westward, Halsey sent out an order, " Task Force 34 will be formed if Japanese sortie from San Bernardino, when directed by me." Unfortunately, this message was sent over a small wireless inter-ship communication set, and never reached Kinkaid. Very shortly after it was sent, Halsey received two reports from his reconnaissance aircraft ; the first saying that the enemy carrier fleet was 200 miles from the N.E. point of Luzon ; and the second that Kurita's fleet, badly damaged, was in full retreat to the West.

Halsey had to make a decision : should he stay and guard MacArthur's fleet in case Kurita came out of San Bernardino, and by so doing allow the carriers to escape ; or should he go after and sink the carriers. He was a keen flying man and knew well the value of carriers and the damage they could do. He was all for offensive action and it seemed that this was a chance to destroy these carriers. Perhaps it was the report of Kurita's retreat that decided him to chase them ; anyway, off he went, sending a message to Kinkaid at 7.50 p.m., " Kurita's fleet heavily damaged, am proceeding North with three groups to attack enemy carriers at dawn."

Kinkaid read this to mean that the three groups were three of Halsey's carrier groups, and he was quite happy as he felt sure that Task Force 34 was in position off the eastern end of San Bernardino. Less than an hour later Halsey got news that Kurita had turned and was making for the East end of San Bernardino. He passed this message on to Kinkaid without comment, but he made no alteration in his plan to chase the carriers, nor did he give any orders for Task Force 34 to remain behind.

Leaving Kurita and Halsey for the moment, we will turn to Nishimura and Shima. Nishimura with his fleet parted company from Kurita's fleet when it sailed from Brunei Bay. He was to pass through the Surigao Sea and, with Shima's squadron backing him up, to attack MacArthur's fleet from the West at the same time as Kurita, who had much farther to go, attacked from the East. The two attacks were designed to crack MacArthur as a nutcracker cracks a nut. Nishimura had two battleships, one 8 in. cruiser and four destroyers. Shima had two 8 in. and one light cruiser and four destroyers.[1]

THE ATTACK FROM THE WEST

Nishimura went on too fast, with the result that he reached a position well within the area that Kinkaid's aircraft could watch, and there he dawdled about

[1] See track chart facing p. 80

waiting for the time to make the final run in to the attack. If he had kept further out until later, his fleet might not have been spotted, but as it was Kinkaid's aircraft soon found it and reported its position. Kinkaid at once realized that the Japanese were going to attack from the West and prepared to give them a hot reception. He so disposed his fleet that as Nishimura approached Leyte, the American fleet would cross the Japanese "T."

About midnight of 24th/25th October, Nishimura's fleet was about twenty miles up the Surigao Strait and approaching Leyte Gulf, when it was attacked by destroyers. Although they were unable to stop its advance, they did quite a lot of damage, and sank one battleship. Nishimura pushed on, and about 3 a.m. came under the combined concentrated fire of all Kinkaid's battleships and cruisers. They had been waiting for him, and for the next twenty minutes they gave him all they could. At the end of that time, with the exception of one destroyer—the "Shigure," Nishimura and his fleet were sunk or sinking.

Shima was coming along about twenty miles behind. He had no idea what had been going on, or where Nishimura was. There had been no co-operation between the two fleets. While the sole remaining destroyer of Nishimura's fleet was stopped to repair damage to her steering gear, Shima's fleet came by and challenged her. She replied, "I am Shigure, I have rudder damage." Shima went on. The "Shigure" never reported that she was the sole survivor of Nishimura's fleet, nor what had happened to it. "No," said her Captain later on, "I was not under Shima. Why should I report to him?" For many years to come that will probably be quoted as a classic example of lack of co-operation.

Shima steamed on, and as soon as he entered the Gulf he was attacked by torpedo-craft. There was frantic excitement in his flagship; everyone rushed to watch the attack and no one was looking ahead. His flagship—an 8 in. cruiser, ran slap into one of Nishimura's ships which had been left by the same attackers in a sinking condition three hours before, but was still afloat. No very great damage was done, but it made Shima realize that things had not been going well, and he came to the conclusion that the sooner he got his fleet out of it the better. So he gave up the attack and managed to retire without losing any of his ships.

Kinkaid's fleet had scored heavily over the Japanese, but his ships were by now short of fuel and had used up most of their ammunition. They had, therefore, to refuel and fill up with fresh ammunition—a job that takes time.

THE DECOY

Now let us return to Halsey. On 25th October, at about 4 a.m. his whole fleet, except for one group under Vice-Admiral McCain which was away refuelling, was chasing Ozawa's carriers. He was quite happy, and so was the man he was chasing. Ozawa had succeeded in decoying Halsey away from Leyte while Kurita went in to attack.

Nishimura and his fleet were dead; their attack had been a complete failure. Shima was retiring; he had not attempted to press home his attack. Kinkaid was jubilant: his fleet had smashed the attack from the West, and he was confident that if an attack from the East were to develop, it would be dealt with by Halsey's Task Force 34. His staff, however, who had been plotting Kurita's progress, were not so happy about the situation, so when Kinkaid reported to Halsey that the attack by Nishimura's and Shima's fleets had been repulsed, they got him to ask: "Is Force

34 guarding San Bernardino?" About three and a half hours later, roughly at 7 a.m., the answer to Kinkaid's question was provided—by the Japanese.

It will be remembered that Kinkaid had an arc of ships consisting of eighteen jeep carriers and twenty destroyers and destroyer escorts, some seventy miles out to the East of Leyte. This fleet was under the command of Rear-Admiral Thomas L. Sprague. At 6.30 a.m. the radar operator on Sprague's flagship reported that there were ships coming down from the North along the East coast of Samar. This was perplexing as no ships were supposed to be there. Twenty minutes later there was no doubt about it at all: Kurita's fleet was spotted about eighteen miles off coming in fast. Sprague reported this to Kinkaid and at once ordered his soft-sided ships to get out of danger at full speed, which in their case was 18 knots. At the same time he ordered every aircraft that could be armed to attack, and he sent in his three destroyers and four destroyer escorts to make a suicide attack on the approaching enemy fleet. Luckily it was a misty, rainy day, and this with the smoke screens which Sprague put up made the visibility very bad; nevertheless, the great "Yamato" opened fire with her 18 in. guns at 35,000 yards. Think of shells nine feet in length with a waist line of some 56 inches, weighing a ton and a half, coming down on ships which had no armour protection whatever.

A few minutes later Kinkaid received a message from Halsey to the effect that Task Force 34 was with him attacking the Japanese carriers. Kinkaid, who had already ordered his own battleships to go to Sprague's assistance, at once signalled to Halsey for help, explaining that his own ships were very short of ammunition. But Halsey was hot in pursuit of Ozawa, and was annoyed at getting appeals for help just at the time he was closing his prey. He did, however, send orders to McCain who, it will be recalled, was refuelling his squadron, and told him to go to Kinkaid's help. In fact, McCain had already picked up Kinkaid's messages and, realizing the situation, had sent his carriers off before Halsey's order reached him. (A good example of a subordinate using his own initiative.)

Messages from Kinkaid to Halsey continued to arrive; but the latter continued to chase and so increase the distance between himself and Kinkaid. Finally Admiral Nimitz, as C.-in-C., took a hand in the matter and sent a message to Halsey. This was in code, and in order to make it more difficult to break he added some padding. The message read: "The whole World wants to know where is Task Force 34?" Halsey, so the story goes, when this message was handed to him, took his hat off and flung it on the deck and said things which he owned afterwards he was ashamed to remember.

He still went on, but this last message had started him thinking, and when he received further urgent appeals from Kinkaid, which were sent in clear, he saw sense. It was now 11.15 a.m. on the 25th, and Halsey ordered his battleships to turn and go to Kinkaid's help, while Vice-Admiral Mitscher—his second in-command, was left with the carriers to continue the chase after Ozawa; but Halsey had no hope of reaching Leyte before that evening at the earliest: he had kept on far too long for that to be possible.

We have noted that Kinkaid's latest messages were sent in clear; one was "Send Lee's battleships at once."[5] There were two reasons for this, one to show the urgency of the matter, and the other to bluff the Japanese. The last idea was a forlorn hope, but as so often happens with forlorn hopes, it came off. The Japanese

[5] This referred to Task Force 34.

picked it up and thought that Lee's battleships were close by, instead of being some hundreds of miles away, and this, as we shall see, had a great effect on the course of events.

While Halsey was hurrying back, Vice-Admiral Mitscher with the carriers continued the chase, and finally caught up with the Japanese carrier fleet. To his surprise, instead of being attacked by swarms of enemy aircraft, very few indeed left the decks of the carriers. The fact was that in the battle the day before, most of Ozawa's aircraft, which had been defending Kurita, had run out of fuel and had had to come down in Luzon to be serviced, and had not been able to rejoin their ships. Mitscher consequently had an easy job to do and a very strong force to do it with. He sank four carriers, one light cruiser and two destroyers. His own losses were negligible. Nevertheless Ozawa's fleet had done its job of decoying Halsey away from Leyte.

Now we will return to Kurita. It will be remembered that on the 24th, having reformed his fleet, he turned back to his original course and stood on through the night and, after a difficult feat of navigation in getting his large fleet through a tortuous strait in the dark, he emerged in the early dawn with his ships' companies at action stations, quite expecting that he might meet Halsey's fleet just outside the eastern entrance to San Bernardino. Halsey was not there, so he continued his journey down the East coast of Samar until, to the surprise and consternation of his enemy, he ran into their outer ring. The fox was definitely inside the chicken run and Sprague with his light ships had to make off as fast as he could.

It was very difficult for Kurita to know what he might find he was up against, for the visibility was poor. His ships could only fire at targets as they came out of the mist and, as often as not, even when they hit, they had no idea what they had been engaging; destroyers were reported as cruisers, cruisers as battleships, and jeep-carriers as battleships or very large cruisers. Sprague's small ships were having a thin time; he lost two jeep-carriers,[6] two destroyers, and a destroyer escort;[7] but in exchange for them the Japanese lost three 8 in. gun cruisers.[8] In the course of this fighting Kurita's ships had shot at and chased whatever they had been able to see, and they were soon separated all over the area; so, in order to reform his fleet, he ordered all ships to close on a northerly course, in other words they had to stop chasing and turn in the opposite direction to which the enemy were retiring. By 11 a.m. the fleet had reformed and was again steering South towards Leyte.

KURITA'S GOLDEN OPPORTUNITY

Now, if only he had seized it, was Kurita's golden opportunity; but reports—all very exaggerated—began to come in, and he was trying to sort out the situation from what information he received. He was also getting the *en clair* American messages. Ozawa's messages to him, telling him of the success of the decoy, failed to reach him owing to faulty wireless on Ozawa's flagship. Kurita had no idea of the real position of the main American fleet, so he despatched his two available reconnaissance aircraft to go and find it. He heard nothing from one of them, while the other, before relapsing into silence, reported that he was being pursued by hostile aircraft. That was not much help, and Kurita must have been left thinking hard. By now MacArthur's "soft" fleet had got wind of his arrival and had escaped, but Kurita was convinced that he had been fighting a fast carrier fleet, with many cruisers and destroyers, and that he had inflicted very heavy damage on it, having, as he

[6] The "Gambier Bay" and "St. Lo."
[7] The "Hoel," "Johnston" and "Samuel B. Roberts"
[8] The "Chokai," "Chikuma" and "Suzuya."

thought, sunk at least four carriers, two heavy cruisers and some destroyers, and damaged several other ships. He also got the impression from wireless messages which were now filling the air that there was a force of the enemy to the North of him. His conclusion from all the reports that he had received was that he was being lured on towards a powerful superior fleet. It was not good enough : he would gain nothing and would only lose his whole force. He gave up his attack on Leyte and stood to the North, expecting to meet this superior force, which, of course, was quite imaginary.

The ball had been at his feet, but he had refused to kick it. As the Americans put it, the whole of MacArthur's fleet had been offered to Kurita on a salver and he refused to accept it. One of the first of the main principles of war, as laid down in all the text books, is " The Maintenance of the Object." Kurita's failure will always be a classic example of the result of not adhering to that principle.

Some years after the battle, he was asked for his reasons for not going on. He said : " I did not know that Admiral Halsey had taken his fleet North. I moved with only the knowledge that I was able to acquire with my own eyes and did not realize how close I was to victory. I see now that it was very regrettable that I did not push on at the time."

It was now afternoon, and McCain's carrier aircraft had arrived and had found Kurita's fleet, which they attacked vigorously. Aircraft from some of Kinkaid's escort carriers also attacked throughout the day. Kurita was getting severe punishment, and he asked for help from the land-based aircraft on Luzon. The Japanese army flying force was able to respond at once. What the pilots lacked in skill they made up in pluck ; they realized that they were not much of a match against the highly-trained American flyers, so they adopted their *kamikaze* tactics : volunteer pilots took up their aircraft fully loaded with bombs, flew them down into an enemy ship, and blew up.

Kurita, bombed and chased, finally got his fleet back to Brunei Bay. Out of the magnificent force that he had led out a week before he had lost one of his super-battleships, six 8 in. and two light cruisers and seven destroyers. Most of his remaining ships were damaged.

Shima's fleet was also caught while retiring and lost one light cruiser. Two other cruisers were damaged by the U.S. air forces.

After some months of hard scraping the Japanese managed to provide sufficient fuel to enable the remnant of their great navy, headed by the super-battleship " Yamato," to set out on a last suicide mission. It did not come back.

CONCLUSION

It is interesting to note that the modern battleships on both sides were never really tried out against each other. Kurita's battleships engaged and sank jeep carriers and destroyers—soft-shelled vessels. Halsey's battleships spent their time chasing North after Ozawa and returned South too late to kelp Kinkaid. They never fired a shot. The carriers and their aircraft took the honours, especially when they sank the 72,000 ton " Musashi." But it is fair to say that on the night of the 24th, Kinkaid's battleships in Surigao Strait played a vital part in the defence of the American landing ; no aircraft were present.

The Battle for Leyte Gulf lasted four whole days. It was fought over a sea area larger than double the size of France. The result was the end of the Japanese navy as a fighting force. The immediate effect—the capture of the Philippines by the U.S. forces—was a deciding factor in finishing the War in the Pacific.

APPENDIX[9]

U.S. SEVENTH FLEET—Vice-Admiral THOMAS C. KINKAID

(GROUPS TAKING PART IN THE ACTION)

ESCORT CARRIER (C.V.E.) FLEET

REAR-ADMIRAL THOMAS L. SPRAGUE

NORTHERN GROUP

CARRIER DIVISION 25

4 *Escort Carriers*
- "Fanshaw Bay" (Flag)
- "White Plains"
- "Kalinin Bay"
- "Saint Lo" Sunk by Japanese aircraft off Samar on 25th October, 1944.

CARRIER DIVISION 26

2 *Escort Carriers*
- "Kitkun Bay" (Flag)
- "Gambier Bay" Sunk by Japanese aircraft off Samar on 25th October, 1944.

3 *Destroyers*
- "Hoel" } Both sunk by Japanese aircraft off Samar on 25th October, 1944.
- "Johnston" }
- "Heerman"

4 *Destroyer Escorts*
- "Dennis"
- "John C. Butler"
- "Raymond"
- "Samuel B. Roberts" Sunk by Japanese aircraft off Samar on 25th October, 1944.

SOUTHERN GROUP

CARRIER DIVISION 22

6 *Escort Carriers*
- "Sangamon" (Flag)
- "Suwanee"
- "Santee"
- "Petrof Bay"
- "Chinango"
- "Saginaw Bay"

3 *Destroyers*

3 *Destroyer Escorts*

MIDDLE GROUP

CARRIER DIVISION 24

2 *Escort Carriers*
- "Natoma Bay" (Flag)
- "Manila Bay"

CARRIER DIVISION 27

4 *Escort Carriers*
- "Marcus Island" (Flag)
- "Kadashan Bay"
- "Savo Island"
- "Ommaney Bay"

3 *Destroyers*

4 *Destroyer Escorts*

BOMBARDMENT AND FIRE SUPPORT GROUP

REAR-ADMIRAL JESSE B. OLDENDORF

LEFT FLANK
REAR-ADMIRAL OLDENDORF

3 *Heavy Cruisers*
- "Louisville" (Flag)
- "Portland"
- "Minneapolis"

2 *Light Cruisers*
- "Denver"
- "Columbia"

9 *Destroyers*

CENTRE FLANK
REAR-ADMIRAL WEYLER

6 *Battleships*
- "Mississippi" (Flag)
- "West Virginia"
- "Maryland"
- "Tennessee"
- "California"
- "Pennsylvania"

6 *Destroyers*

RIGHT FLANK
REAR-ADMIRAL BERKEY

1 *Heavy Cruiser*
- H.M.A.S. "Shropshire"

2 *Light Cruisers*
- "Phoenix" (Flag)
- "Boise"

6 *Destroyers* (including one Australian)

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[9] This Appendix to the foregoing article has been compiled with the object of providing a record of the organization of the Fleets which took part in the Battle for Leyte Gulf, the names of the principal ships and, in the case of the Japanese, the casualties which wrecked their Navy.—EDITOR.

U.S. THIRD FLEET—Admiral WILLIAM F. HALSEY

Task Force 38—Vice-Admiral S. Mitscher

Task Group 38.1
Vice-Admiral John S. McCain

5 *Carriers*
- "Wasp"
- "Hornet"
- "Hancock"
- "Monterey"
- "Cowpens"

4 *Heavy Cruisers*
- "Chester"
- "Pensacola"
- "Salt Lake City"
- "Boston"

2 *Light Cruisers*
- "San Diego"
- "Oakland"

14 *Destroyers*

Task Group 38.2
Rear-Admiral Gerald F. Bogan

3 *Carriers*
- "Intrepid"
- "Cabot"
- "Independence"

2 *Battleships*
- "Iowa"
- "New Jersey"

3 *Light Cruisers*
- "Biloxi"
- "Vincennes"
- "Miami"

16 *Destroyers*

Task Group 38.3
Rear-Admiral Frederick C. Sherman

4 *Carriers*
- "Lexington"
- "Essex"
- "Langley"
- "Princeton" (Severely damaged by Japanese and finally sunk by U.S. forces in Sibuyan Sea, 24th October, 1944)

2 *Battleships*
- "Massachusetts"
- "South Dakota"

4 *Light Cruisers*
- "Santa Fe"
- "Birmingham"
- "Mobile"
- "Reno"

14 *Destroyers*

Task Group 38.4
Rear-Admiral Ralph Davison

4 *Carriers*
- "Enterprise"
- "Franklin"
- "San Jacinto"
- "Belleau Wood"

2 *Battleships*
- "Washington"
- "Alabama"

2 *Heavy Cruisers*
- "Wichita"
- "New Orleans"

15 *Destroyers*

JAPANESE SECOND (SOUTHERN) FLEET—Vice-Admiral KURITA

First and Second Sections

(Attacked through San Bernardino Strait)

5 Battleships

"Yamato" (Flag) ...	Survived the Battle but was sunk in the final sortie on 7th April, 1945, by about 11 torpedoes and 4 bombs from U.S. carrier aircraft.
"Musashi"	Sunk by concentrated attack with torpedoes and bombs by carrier aircraft of the U.S. Third Fleet, 24th October, 1944, during the approach to the San Bernardino Strait.
"Nagato"	Survived the Battle but was severely damaged during an Allied naval air attack on Yokosuka on 18th July, 1945.
"Kongo"	Survived the Battle but was torpedoed by U.S. submarine "Sealion" on 21st November, 1944.
"Haruna"	Survived the Battle but was wrecked by carrier aircraft of the U.S. Third Fleet on 28th July, 1945.

10 Heavy Cruisers

"Atago"	Torpedoed and sunk by U.S. submarine "Darter" in the Palawan Passage, Philippines, shortly after midnight on 23rd October, 1944, prior to the Battle.
"Maya"	Torpedoed and sunk by U.S. submarine "Dace" in the Palawan Passage, Philippines, shortly after midnight on 23rd October, 1944, prior to the Battle.
"Takao"	Severely damaged by the U.S. submarine "Darter" in the Palawan Passage, Philippines, shortly after midnight on 23rd October, 1944, prior to the Battle. Surrendered at Singapore and was scuttled in 1946.
"Chokai" ... ... "Suzuya" ... ... "Chikuma" ...	All sunk by U.S. carrier aircraft of the Seventh Fleet during the Battle off Samar on 25th October, 1944.
"Myoko"	Damaged by torpedoes of the U.S. Seventh Fleet in the Sibuyan Sea on 24th October, 1944, during the Battle.
"Haguro"	Survived the Battle but was torpedoed and sunk by British "V" Class destroyers on 16th May, 1945, after previous bombing by aircraft of H.M. Escort Carrier "Shah."
"Kumano"	Damaged but survived the Battle. Sunk by U.S. carrier aircraft on 25th November, 1944.
"Tone"	Survived the Battle but was sunk by carrier aircraft of the U.S. Third Fleet on 24th July, 1945.

2 Light Cruisers

"Noshiro"	Torpedoed and sunk by carrier aircraft of the U.S. Third Fleet while retreating through the Sulu Sea after the Battle on 25th October, 1945.
"Yahagi"	Survived the Battle but was sunk by carrier aircraft of the U.S. Fifth Fleet in the final sortie on 7th April, 1945.

15 Destroyers

"Hayashimo" ... "Fujinami" ... "Nowake"	All sunk by U.S. carrier aircraft off Samar on 26th–27th October, 1944.
"Shimakaze" ... "Hamanami" ... "Naganami" ...	All survived the Battle but were sunk by U.S. carrier aircraft of the Third Fleet on 11th November, 1944.

"Okinami" ... ...
"Akishimo" ... ... } Both survived the Battle but were sunk by U.S. carrier aircraft of the Third Fleet on 13th November, 1944.

"Kishinami" ... Survived the Battle but torpedoed by U.S. submarine "Flasher" on 14th December, 1944.

"Urakaze" ... ... Survived the Battle but sunk by U.S. submarine "Sealion" on 21st November, 1944.

"Kiyoshimo" ... Survived the Battle but sunk by U.S. destroyer on 26th December, 1944.

"Isokaze" ... ...
"Asashimo" ... ...
"Hamakaze" ... } All survived the Battle but sunk by U.S. carrier aircraft of the Fifth Fleet on 7th April, 1945.

"Yukikaze" ... Survived the Battle. Allocated on surrender to China.

16TH CRUISER DIVISION

(Detached from Admiral Kurita's Forces and ordered by Admiral Toyodo to proceed to Manila)

1 *Heavy Cruiser*

"Aoba" ... ... Torpedoed and disabled by U.S. submarines while entering Manila Harbour. Sunk by aircraft of U.S. Third Fleet, 25th July, 1945.

1 *Light Cruiser*
"Kinu" ... ...
1 *Destroyer*
"Uranami" ... } Both employed in escorting transports to Leyte, but sunk by U.S. Forces when returning to Manila on 26th October, 1944.

THIRD SECTION—VICE-ADMIRAL NISHIMURA

(Attacked through Surigao Strait)

2 *Battleships*

"Fuso" ... ...
"Yamashiro" (Flag) } Both sunk in night action with the U.S. Seventh Fleet in the Surigao Strait, 25th October, 1944.

1 *Heavy Cruiser*

"Mogami" ... ... As above.

4 *Destroyers*

"Michisio" ... ...
"Asagumo" ... } As above.
"Yamagumo" ...

"Shigure" ... ... Survived the Battle but was torpedoed and sunk by the U.S. submarine "Blackfin" on 24th January, 1945.

JAPANESE FIFTH (NORTHERN) FLEET—Vice-Admiral SHIMA

(Entered Surigao Strait but only made a torpedo attack)

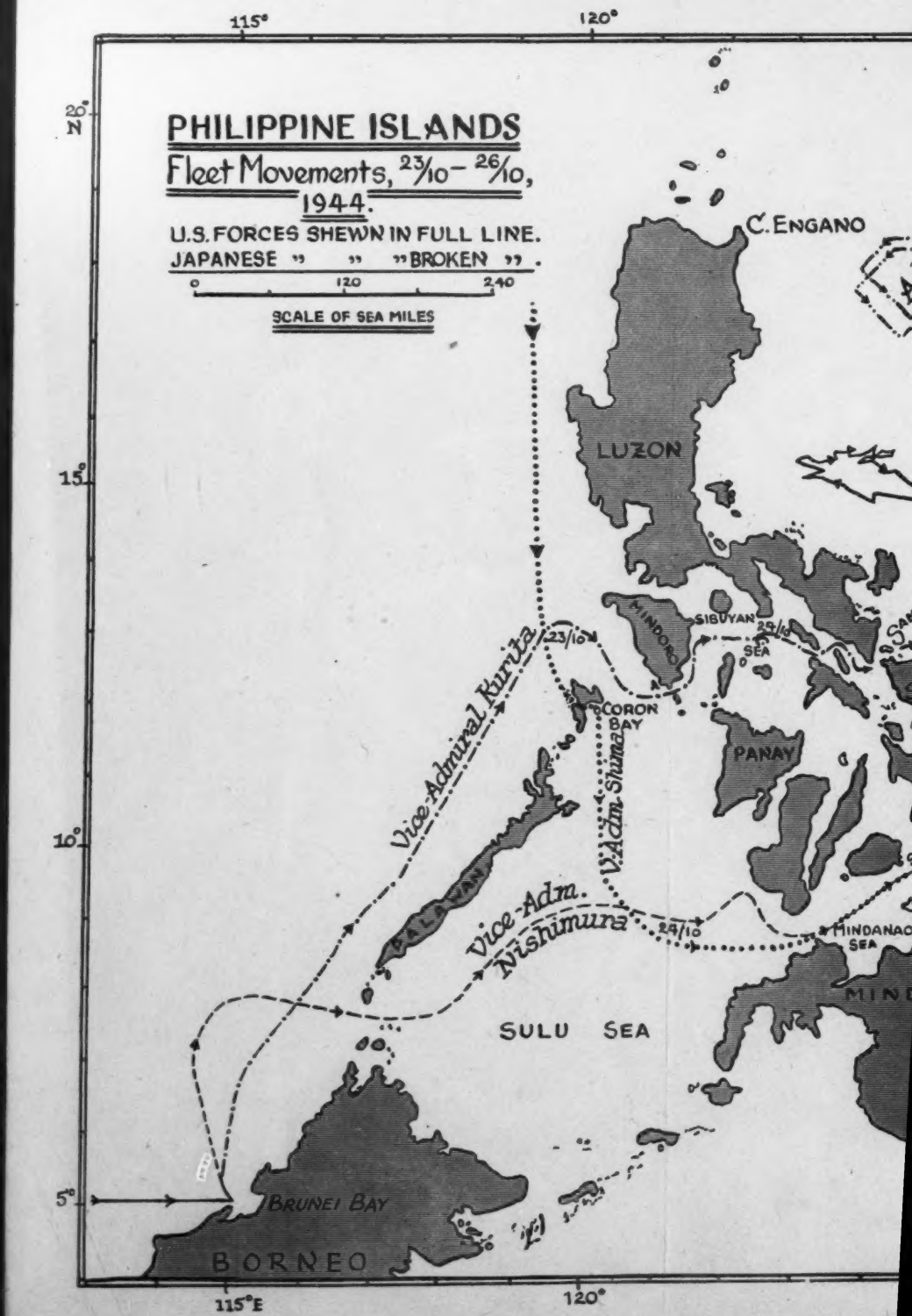
2 *Heavy Cruisers*

"Nachi" (Flag) ... Severely damaged in collision with the "Mogami" in the Surigao Strait and finally torpedoed in retreat by U.S. carrier aircraft of the Third Fleet, 5th November, 1944.

"Ashigara" ... Survived the Battle, but was torpedoed and sunk by H.M. Submarine "Trenchant," on 8th June, 1945.

1 *Light Cruiser*

"Abukuma" ... Severely damaged in the Battle of Surigao Strait and finally sunk on 26th October, 1944.



THE BATTLE FOR LEYTE GULF

125° E
20°
15°
10°
5° N
125°
GANO
Admiral Ozawa
25/10
Admiral Halsey.
(Vice-Admiral Mitscher commanded Carrier Force under Halsey).
24/10
SAN BERNARDINO ST
SAMAR
LEYTE G.
25/10
Admiral Sprague
SURIGAO STRAIT
MINDANAO SEA
MINDANAO

E GULF

4 *Destroyers*

"Shiranui"	Severely damaged in the Battle of Surigao Strait, and finally sunk on 27th October, 1944.
"Kasumi"	Survived the Battle but was torpedoed and sunk by U.S. carrier aircraft of the Fifth Fleet on 7th April, 1945.
"Ushio"	Both severely damaged during the Battle in the Surigao Strait.
"Akebono" ...	

JAPANESE THIRD (CARRIER) FLEET—Vice-Admiral OZAWA

(The Decoy Force)

2 *Battleship-Carriers*

"Ise"	Both survived the Battle but were sunk by U.S. carrier aircraft of the Third Fleet in July, 1945.
"Hyuga"	

3 *Large Carriers*

"Zuikaku" (Flag) ...	The last survivor of the attackers of Pearl Harbour, she was torpedoed and sunk by U.S. carrier aircraft of the Third Fleet off Cape Engano on 25th October, 1944.
"Amagi"	In commission but not operational at the time of the Battle. Dive-bombed and sunk by U.S. carrier aircraft of the Third Fleet on 24th July, 1945.
"Unryo"	In commission but not operational at the time of the Battle. Torpedoed by U.S. submarine "Redfish" on 19th December, 1944.

5 *Small Carriers*

"Chitose"	All sunk by U.S. carrier aircraft of the Third Fleet off Cape Engano on 25th October, 1944.
"Chiyoda"	
"Zuiho"	
"Junyo"	Served as aircraft transports; did not take part in the battle.
"Ryuho"	

3 *Light Cruisers*

"Tama"	Sunk by U.S. carrier aircraft and the submarine "Jallao" off Cape Engano on 25th October, 1944.
"Oyodo"	Survived the Battle but was sunk by U.S. carrier aircraft of the Third Fleet on 28th July, 1945.
"Isuzu"	Survived the Battle but was sunk by the U.S. submarines "Chart" and "Gabilan" on 7th April, 1945.

10 *Destroyers*

"Shimodzuki" ...	Survived the Battle but was torpedoed by U.S. submarine "Cavalla" on 25th November, 1944.
"Fuyutsuki" ...	Both severely damaged prior to the Battle by U.S. submarines, 12th October, 1944.
"Suzutsuki" ...	
"Hatsuyuki" ...	Sunk by U.S. carrier aircraft off Cape Engano on 25th October, 1944.
"Wakatsuki" ...	Survived the Battle but was sunk by U.S. carrier aircraft on 11th November, 1944.
"Akitsuki"	Probably sunk by U.S. submarine "Halibut" off Cape Engano on 25th October, 1944.
"Kuwa"	Survived the Battle but was sunk by U.S. destroyers on 3rd December, 1944.
"Maki"	Survived the Battle, allocated on surrender to Britain.
"Sugi"	" " " " " " China.
"Kiri"	" " " " " " Russia.

THE BERLIN AIR LIFT

OPERATION "PLAIN FARE"

By "ORION"

THE ruins of Berlin—the once illustrious capital of Prussia and Greater Germany, are a monument to the intolerance and mad abuse of power by so-called civilized man. Here the Allies of East and West met together to impose the terms of peace upon a vanquished enemy. Yet those same Allies now challenge each other like gladiators in the arena, under the eyes of their former foes. This clash of wills has resolved itself into a struggle between those who command the land approaches and those who command the air approaches to Berlin.

Operation "Plain Fare" started at the end of June, 1948. The air lift began with the operation of a few transport aircraft which carried only high priority supplies and mail, primarily for the occupying troops. To-day over two million people in the American, British and French sectors in Berlin and all their community activities are maintained solely by the *Luftbrücke*.

The airfields in West Germany being used for loading aircraft are Lübeck (Br.), Wunstorf (Br.), Fasseberg (Br.), Frankfurt (U.S.A.), and Rhein-Maine (U.S.A.). The reception airfields in Berlin are Gatow (Br.), Tempelhof (U.S.A.), and now Tegel in the French sector. Schleswig-Land has lately been opened at the dispatching end, and Celle will come into operation in due course.

The fleet of transport aircraft comprises American C54s or Skymasters, and British Yorks, Dakotas and, more recently, Hastings, supported by a civilian element of several Tudors, Lancastrians, Haltons, Dakotas, Vikings and Bristol freighters. There are also some ten flying boats of Coastal Command and a civil Hythe which operate between Hamburg and the Havel See near Gatow. The addition of the Hastings, with its 3,000 cubic feet capacity and 8–9 tons lift, should give substantial assistance to the British effort. On average the aircraft serviceability is maintained at about 60 to 70 per cent., and each serviceable aircraft hopes to complete at least two and sometimes three or four sorties a day.

The American C54s are carrying an average of 9 tons of cargo, mainly coal, and the Yorks carry 7½ tons of various commodities. The Tudors and some Lancastrians are being used as tankers, and each carries about ten tons of fuel oil, while the Dakotas are carrying just over three tons of mixed cargo per sortie. As an overall average, each aircraft is worth some 7 tons per sortie. From this we see that a 100 sorties will give us 700 tons, and it will take 600 sorties to deliver 4,200 tons.

The Americans were transporting about 65 per cent. of the total lift, but this has now increased to almost 80 per cent. But this cannot all be discharged at their main reception airfield at Tempelhof; thus a proportion of American aircraft are operating from the British airfield at Fasseberg and are discharging at Gatow, which already receives the whole of the British contribution. In fact the number of aircraft landed at Gatow considerably exceeds the number landed at Tempelhof, and this has produced its traffic problems. It will be seen from the following figures, which summarize the effort for the first hundred days of the operation, just what proportions have been lifted by the American and British transport forces, and what proportions were being cleared through these two airfields at Berlin :—

Total tonnages up to 5th October—

U.S.A. ...	...	181,213.4 tons or 65.2 per cent.
British ...	...	97,038.0 „ „ 34.8 „ „
Combined ...	...	278,251.4 tons

Cleared to Berlin on 5th October—

Tempelhof ...	226 aircraft	(U.S.A.)	1,897.1 tons	
Gatow ...	187 „	(U.S.A.)	1,640.9 „	427 aircraft
	240 „	(Br.)	1,186.0 „	2,826.9 tons
Combined ...	653 aircraft		4,724.0 tons	

By the end of October the total weight of supplies reaching Berlin had exceeded 400,000 tons.[1] Of this the Americans had carried over two-thirds.

As might be expected the best use is made of the greatest load carriers. Accordingly a proportion of the C54s are working from the airfield closest to Berlin—the British airfield at Fasseberg. They carry mainly coal which can be handled expeditiously, thereby saving turn-round time. What is more, coal makes the fullest use of aircraft capacity, while bulky supplies, which may not permit the use of the full weight capacity of an aircraft, are allotted to British aircraft.

The effect of giving every advantage to the American C54s is that the effort in terms of tons lifted of the smaller capacity British transport force is proportionately lower than it might otherwise appear. On the other hand the combined staffs are making the best use of the Anglo-American capacity without fear or favour. And under these arrangements the British are providing a larger proportion of the ground facilities than of carrying capacity.

Aircraft are dispatched in blocks, each airfield being given its appointed block of time in which to dispatch its aircraft. This system ensures proper spacing in time of arrival over Berlin. It also ensures that aircraft flying from different airfields do not become involved with each other. This is particularly important in bad weather where so many types of aircraft are concerned, for otherwise those flying at different speeds would be constantly overtaking each other *en route*. Another consideration is that, without some such system, aircraft of varying types would arrive at Gatow at the same time, which would complicate unloading. For instance, the four-engined aircraft naturally take longer to unload than the twin-engined, and therefore the latter would inevitably be held up when they found themselves on the discharging line immediately behind bigger aircraft. On the other hand this block system tends to produce peak loading periods at the dispatching airfields. However, it is hoped to find some effective compromise which will satisfy all requirements.

Aircraft take off from their dispatching airfields at intervals of three minutes. Each block flies at three different heights, each successive aircraft being given a different height from the preceding two. This means that there is a spacing of nine minutes between any two aircraft flying at the same height.

[1] This article was written in November, 1948, since when the lift has been maintained and even greater daily tonnages achieved. Some later figures will be found in Air Notes, page 148.—EDITOR.

As aircraft approach Berlin they must pass over two check points. They call up at the first and are told whether they should make up or lose time. This ensures a certain degree of flexibility in the timing of arrivals at the airfield. By the time aircraft reach the second check point flying control will have them properly phased and landings can be timed to within a few seconds.

Landings under instrument-flying conditions can be made at the rate of one aircraft every three or four minutes at each reception airfield. In practice a total of 241 aircraft have been landed by G.C.A. (Ground Control Approach) within a single twenty-four hour period, which is an outstanding achievement. One of the main bottle-necks in the air lift has inevitably been the capacity of the Berlin airfields, and the opening of the new airfield at Tegel naturally eases this problem. Hitherto Tempelhof and Gatow have been accepting between 350 and 450 landings in twenty-four hours. The record at Gatow was 454 on 17th October. With Tegel, it is now hoped to land a thousand or more aircraft per day in favourable conditions.

There are three corridors across the Russian zone which form an arrowhead pointing from the West towards Berlin. From Berlin one corridor runs to the North-West, a second due West, and a third to the South-West. They are twenty miles wide and extend from 1,000 feet to 10,000 feet in depth. All air traffic approaching Berlin at varying heights must fly up the outer corridors from the North-West and South-West, and return due West down the central corridor. This ensures that all traffic is flying in the same direction and reduces the chances of collision to a minimum.

The system for the dispatch and receipt of loads begins with the consolidation of requirements for the civil and military authorities in Berlin. These requirements are signalled back to the Army Air Transport Organization (A.A.T.O.) which arranges with the appropriate supply authorities to bring the right loads to the required airfields. Here the Rear Air Supply Organization (R.A.S.O.), controlled by A.A.T.O., packs the cargoes and loads them into one or more lorries making up separate aircraft loads. The Army staff of the R.A.S.O. keeps in intimate touch with the operational staff who indicate the aircraft which are ready for loading. The R.A.S.O., employing German labour for handling parties, drive out to the aircraft and load up. As soon as this is complete the load is lashed and finally inspected by the captain of the aircraft.

The flight to Berlin normally takes rather over an hour, the exact time depending, of course, on the airfield of departure. As each aircraft lands it taxies onto a large area of tarmac where it is marshalled into its position immediately behind the preceding one. There may be between ten and twenty aircraft in a line, resembling the production line in some aircraft assembly plant. The unloading is now in the hands of the Forward Air Supply Organization (F.A.S.O.) which is the forward counterpart of the R.A.S.O. and is also controlled by A.A.T.O. As the engines stop a party of German stevedores is driven up in the discharging lorries. If, for instance, the cargo is coal, it is packed in sacks for ease of handling. These are unloaded onto a lorry which is driven to a transfer point. Here the coal is emptied from the sacks into a waiting trailer. The sacks are kept and returned by air in due course. The coal trailer is towed to a jetty by the Havel See where its load is discharged into the capacious holds of coal barges.

The reception of aircraft goes on continuously throughout the day and night, and consequently everything is organized on a twenty-four hour basis. All sections

work in rotation by three eight-hour shifts. The speed of handling is important because it affects the number of unloading parties which must be employed simultaneously. If, for instance, aircraft arrive at the rate of one every two minutes, and each takes 60 minutes to unload, it is clear that there will be 30 aircraft on the ground to be unloaded at any one moment. This means thirty unloading parties. If, on the other hand, the unloading can be speeded up to, say, 20 minutes per aircraft, then there will only be ten aircraft to be handled simultaneously. This is but a random example of the type of mathematical factor which affects every stage of this continuous chain operation. At the present moment the average turn-round time is in the order of 40 minutes.

When the Operation began, the commitment was only for some four hundred tons per day, which in turn only involved a few aircraft. These small-scale operations were controlled by the respective American and British Air Force Headquarters in Germany. As the commitment increased to thousands of tons per day absorbing some three hundred aircraft, so it became necessary to establish a "Combined Airlift Task Force" to co-ordinate all Allied transport operations. This is commanded by an American—Major-General Tunner, and his second-in-command is a British officer—Air Commodore Merer. The organization is based on the pattern which came to be known in the late war as a "parallel" system. Within this organization the British element is responsible to Headquarters British Air Forces of Occupation for the overall conduct of air operations, and to Headquarters Transport Command for all matters connected with the technique of transport operations, and for which C.-in-C. Transport Command is the fountain-head. It is a matter of reaching a suitable organization where the interests and endeavours of the functional and geographic commands of the two Allies can best be combined, so that we may enjoy the experience and co-ordinated efforts of all.

The Winter problems will be considerable, but by no means insurmountable. The Services themselves will need increased allocations of lift for winter clothing, and fuel for the limited amount of heating permitted. Food rations for the Services and civilians will be increased. Owing to the freezing of the lakes and canals the flying boats will no longer be able to operate and the barges which have been carrying coal from Gatow to central Berlin will have to be replaced by road transport. This will to some extent increase the amount of Diesel oil to be lifted in by air. Then there is the problem of snow clearance on the runways without unduly impeding operations, keeping the marshalling areas clear, and also the roads to Berlin. This will demand more fuel for snow-ploughs, but again the increases should be within the increased airlift which the arrival of new formations of American C54s is providing. Our war experience in Bomber Command will greatly assist in combatting the icing problems which will confront our aircraft. On the whole there should be little interference with the flow of air traffic across the *Luftbrücke* for which the flexibility of the transport organization will not be able to compensate.

The outstanding feature of this formidable operation is the smoothness and efficiency with which it is now working. On the ground the work of the Army echelons responsible for delivering the right commodities to the right airfields, for loading the aircraft swiftly and with due attention to the proper stowage and lashing of loads—vital for the safety of aircraft—and for the unloading and clearance of loads from airfields at Berlin, has been a model of administrative excellence. The flying control organization has proved itself capable of carrying the severe and

continuous burden with great efficiency and has won the deserved confidence of the aircrews. In the air it is difficult to praise too highly the zeal and sterling competence of the aircrews. On the British side this standard has been achieved mainly as the result of the intense training programme of Transport Command. It is a gratifying reward for all those who contributed to the moulding of the scheme of categories and the building up of the youngest command of the Royal Air Force.

It is difficult to imagine what might be the political consequences of a failure to maintain the lift at the necessary capacity. Who can doubt that it would dangerously aggravate the friction between East and West—perhaps even to flashpoint. The airlift is costly in money and effort, but it is buying priceless time—and, perhaps, in the long run, peace. A heavy responsibility rests once more on the air forces, and upon all those responsible for organizing the supply of Berlin. It is a source of pride and confidence that aircrews from the Commonwealth countries are there to share this responsibility with us.

In conclusion, this air operation holds great significance for the future. The air operations in Burma showed us how we could overcome the disadvantages of attenuated lines of communications. We have now learnt how, with fewer but larger aircraft and in conditions which allow us good though few airfields, and with a highly developed system of air control, the efficiency of air transportation can be increased. A technique developed during the War on a scale adequate for Far Eastern warfare is now shown to be a practical proposition on a Western scale. It conjures up visions of giant hedgehogs projected deep into the heart of a continent and held by perhaps ten or fifteen divisions supported by all the power of modern air weapons. In fact a major strategic reorientation may be brought about to the immense advantage of the Western Allies, provided we make certain that we command the air as completely as we have sought throughout our history to command the sea.

COLOURED FILM OF THE BERLIN AIR LIFT

By William Courtenay, M.M.

On 19th January, a coloured film, which he had taken of the Berlin Air lift, was shown in the Institution theatre by Mr. William Courtenay. He accompanied this with a running commentary, which enabled the audience to appreciate this pictorial record of the operation described in the foregoing article.

Operation "Crossroads"

At the same Meeting, Mr. Courtenay also showed an impressive coloured film, made available to him by courtesy of the U.S. Navy Department, of Operation "Crossroads" (the Bikini Atomic Bomb Tests).

A report of these and their results was published in the Journal for November, 1946.

OCEANOGRAPHY

By Vice-Admiral Sir John A. Edgell, K.B.E., C.B., F.R.S.

BEFORE proceeding with this article, it would be as well perhaps to attempt to define Oceanography. The Oxford Pocket Dictionary describes it as "the physical geography of the Ocean," but it is much more than that, for in the words of Dr. R. H. Fleming, Chief of the Division of Oceanography at the United States Hydrographic Office, "it enhances the characteristics of the sea bottom and the interaction of the sea with the atmosphere, the physical and chemical properties of the water, the living organisms and the interplay and interdependence of many phenomena." All this, in addition to what may be called the normal appreciation of the subject, e.g. ocean currents, salinity, density, temperature, depth, tides, fisheries, etc.

In the year 1873, Her Majesty's ship "Challenger," Captain George S. Nares, sailed from England on a voyage round the World. She carried a team of scientists led by that very distinguished oceanographer Wyville Thomson, and her principal harvest was reaped in the fields of marine biology and geology. The expedition was by far the most ambitious of its kind which, up to that date, had ever been launched; indeed, it is doubtful whether any subsequent investigations have taken pride of place at the expense of the "Challenger"; the fame of her work is world-wide and on the conclusion of her voyage in 1876 and for many years afterwards the fruits of the expedition put Great Britain in the forefront of Oceanography.

As sometimes happens in other spheres, the undisputed leader in the science of Oceanography was content to rest on her laurels, and at the present time, far from being in the forefront, it is fair to say that Great Britain has fallen a long way behind the great majority of maritime nations in her study of physical Oceanography.

The distinction between biological and physical Oceanography is at this stage necessary because the worth and renown of work done by the Marine Biological Association of Great Britain is universally acknowledged to be of a very high order, and it must not be thought that all branches of the science have been neglected. It is, however, a fact that the physical side has fallen into the position of the ugly duckling, perhaps because nobody cared to foster it. There are now encouraging indications that the claim of the physicist to a place in the ocean may be realized and that he may ere long become a partner in an ambitious programme of investigations in a fuller sense than has hitherto been the case.

With this object in view, the writer, some five years ago, put forward a proposal to establish a National Oceanographical Institute in Great Britain. The proposal was well received and favourably reported on by Government departments and scientific bodies, and it is understood that approval has been given to bring it into being. It is hoped that the inauguration of the Institute will not be unduly delayed for there are many problems to be solved, and a vast field for research lies open to the scientist.

There has been a tendency in the past to regard the biological and physical aspects of Oceanography as two quite distinct subjects; this surely is a fallacy, for the two would seem to be indissolubly united by their interdependence. To attempt to exclude one from the study of the other would be to court disaster in the same sort of way as in the indiscriminate planting of trees and other vegetation in soil which is unsuitable or about which nothing is known.

It is natural that the work of the biologist should command support and interest, if only because so many of the problems which he is called upon to examine have to do with the supply of edible fish, their conservation, movements, freedom from contamination, their size and how best to get them to the consumer in good condition.

It is only within comparatively recent years that the importance of physical oceanography has forced itself into some degree of prominence, and the reason for this is not far to seek. The advent of the submarine and the tribulations suffered by the submariner in the early days led to an impeachment of the oceans and questions began to be asked about variation in buoyancy, loss of speed when submerged, unpremeditated diving and the penetration of light through the water. This led to a fairly thorough programme designed to obtain data to determine the temperature, salinity and density at selected positions in all oceans and seas, and from which much useful information was obtained.

Towards the close of the 1914–18 War considerable interest was aroused by the success of certain sound ranging devices designed to fix the position of a ship with great accuracy by means of sub-aquaceous impulses and echoes. Concurrently with sound ranging, the development of echo sounding in both deep and shallow water was encouraged and brought to a state of production and perfection. None the less, the accuracy of the results obtained by both these inventions is dependent upon the knowledge of the chemical properties of the water in which they are used and by which the speed of propagation of sound in this element is controlled.

With the introduction of asdics the desire for fuller information about the properties of sea water and its effect in varying conditions became insistent, and some progress was made in analysing and grouping different types in frequented regions; but there is still a great deal to be done and the crying need at the present time is not so much the collection of material as the examination, analysis and classification of the data already available and from which, not only are lessons to be learnt, but it is to be expected that new features will emerge.

Unquestionably, it is not generally realized that Oceanography is concerned and connected with an imposing array of other sciences and interests. Physics and biology have already been referred to, but in addition, geology, chemistry, meteorology, hydrography, glaciology, vulcanology and even perhaps archæology are all closely associated with what might with considerable justice be styled the parent science. It has been said that Oceanography is a comparatively new science. But *is* it? Is it not rather the fact that it has long been neglected or unrecognized as having a claim to scientific investigation and research? One need not necessarily look to Europe, nor even to the Americas, for the enquiring mind, and there is reason to think that the Chinese gave considerable attention to matters connected with the China Sea, both physical and biological.

Consider what, *inter alia*, in this present year of grace is required of the oceanographer. First, it goes without saying that he is required to know or be able to state the temperature, salinity and density at any place in the ocean at any time of the year. He is expected to know all about layering, whether of temperature or density, the direction, rate and limits of the ocean currents, their seasonal diversions, fading and strengthening; the chemical process connected with biology and bacteriology; the incidences and magnitude of swell; the turbulence associated with prevailing, as against occasional and/or exceptional, wind velocities; the velocity of sound both vertical and horizontal in a given locality; the geological configuration of the sea bed and its composition; the sub-surface movement of ocean currents, including

knowledge of divergence and convergence and their implications; the teeming life in the oceans, its requirements in food, temperature, and freedom from molestation; the vegetable kingdom below the surface of the sea, its reaction to light, to pollution, the encouragement of growth; the way of the whale, its preservation, migration, mating and killing; and a thousand and one matters besides.

So many surprises have been sprung on the World during the last ten years that it is impossible to forecast what form warfare in the future will take; but it may be that sea war will develop into fleet actions carried out below the surface. If this should come to pass, there can be no question that a tremendous asset would be provided by the possession of copper-bottomed information regarding the chemical properties and the movements of the water in which the action takes place, and that it will be necessary to compile a comprehensive series of sub-surface charts or diagrams for the use of those who may by ill chance be involved in this extremely unpleasant form of naval warfare.

Almost as early as the "Challenger" expedition, Germany began to take a keen interest in Oceanography; whereas in England interest flagged, in Germany it was fostered and encouraged so that by 1914 she was the best-equipped nation in so far as knowledge of the ocean was concerned. In Japan, also, the application of the knowledge obtained from oceanographical research came to be appreciated, and the huge programme of work carried out by her ships no doubt provided the answer to many knotty problems connected with under-sea warfare. More recently in the United States of America, renewed interest has been most marked, and the importance of investigation and research in physical oceanography fully recognized.

In Sweden, the remarkable voyage of the "Albatross," recently concluded, had for its major object the securing of core sample of the ocean bed of a length hitherto deemed impossible to obtain. The result of this expedition when worked up should materially assist the solution of many problems.

In Denmark, preparations are being made for a round-the-world expedition to be carried out in the near future. In fact, there is great activity in many countries and the conviction that Oceanography is of real importance is steadily growing.

Enough has been said to show that Great Britain is well in the van where marine biology and fisheries research are concerned, but in the physical domain it is only in the study of waves and of tides that great distinction can be claimed.

One particular weakness in the routine study of physical Oceanography is the lack of precision in fixing the position of the ship or observer when out of sight of land. This weakness is beginning to be better appreciated now and it is to be hoped that far more accurate work will be possible in the future with improved designs and methods of control. At the present time an accurate and detailed examination of even a small portion of the Atlantic Ridge would be impossible without a vast expenditure of time, material and money.

Without a properly equipped office, with a trained staff and an ocean-going research vessel, it is quite impossible to study physical Oceanography as it should be studied. Experiment and research should be encouraged to the utmost and in many directions international collaboration should be sought and encouraged. We have a lot to learn, for we have many years of passivity to make up for, but given the enthusiasm which is to be expected in a body of scientists newly emancipated and set to work on problems which to them are all-important, the leeway should be overcome and Great Britain again become a leader in the oceanographical world.

SUPPLY PROBLEMS IN A NEW GUINEA CAMPAIGN

By Major A. M. Clark Hutchison

In September, 1942, the Japanese advance towards the southern coast of New Guinea was halted some twenty-five miles from Port Moresby, and thereafter they were slowly but steadily driven back over the Owen Stanley Mountains to Buna and Gona. While this was happening it became evident that the Japanese command was contemplating a second thrust southwards from Lae and Salamaua, two of their bases on the North coast, towards Wau. By capturing Wau they hoped to use the airfield for raids on Port Moresby and as an advanced base for a further push southwards, at the same time denying it to us. In furtherance of this aim they had, in January, 1943, approached close to Wau and were on the point of taking it.

To counteract this the Allied command flew into Wau an Australian brigade group to reinforce the numerically weak commando units in the area. This force had the immediate role of securing Wau and the subsequent task of advancing northwards to Salamaua with a view to drawing off as many Japanese as possible from Lae and Salamaua to meet them ; after this, a sea landing could be effected near Lae to take the enemy in the rear, capture his bases and open the way for further moves northwards. The plan was successful.

To appreciate the problems of supplying the brigade group and additional troops which arrived later during the six months campaign, the reader must understand that the force was maintained entirely by air from Port Moresby, the main Allied base in New Guinea at the time. There were no land communications between Wau and Moresby and signal traffic was by wireless only. The airfield had been built before the War for use by the gold-mining companies in the vicinity. It was surrounded by mountains which made navigation and landing difficult and in addition was on a marked slope and somewhat short. However, it proved adequate for Douglas transports, and crashes were few.

From Wau northwards there was only one road and this ended a mile and a half from the township. The Japanese had advanced by native tracks or tracks hacked out of the jungle by themselves. Deployment was restricted owing to the nature of the country—high mountains, deep precipitous valleys and ravines, the whole covered with forest and thick jungle growth. All these features combined to prevent the use of animal transport. The only feasible methods of supply were direct dropping over the troops forward of Wau and landing stores on the airfield and moving them up by native porterage.

Native Porterage

These natives, or " boongs " as they were called by the troops, were small but sturdy, spoke a form of pidgin English and were remarkably loyal to the Australians, there being few cases of their voluntarily assisting the Japanese by offering information or manual labour, and this even in the areas overrun by the enemy in the black days of 1942. They were largely uneducated, although many had come in contact with missionaries. Their normal expectation of life would be about forty years. The natives were recruited from their various tribes by A.N.G.A.U. (Australian and New Guinea Administrative Unit) which mainly comprised officers and men who had lived in the island before the War and understood the local inhabitants. A.N.G.A.U. also supervised their pay, rationing, medical attention and organization into carrier lines, and gave assistance and advice to the staff on any problems connected therewith. Pay was roughly ten shillings per month and an issue of new " lap-laps "

every so often. A " lap-lap " is a brightly coloured cotton garment, a cross between a long loin cloth and a short futa. Food consisted of local products, rice and oatmeal, and each man was regularly given a stick of strong twist tobacco which he cut and rolled into cigarettes, very often using newspaper for the purpose.

The natives were divided into companies or " lines," each " line " being stationed at a staging post on the Line of Communication from Wau along the axis of advance. As our troops moved forward and pressed the enemy back, so were new staging posts added at suitable points. A staging post usually included an Army Service Corps store, accommodation for wounded men and others moving up or down the track, and quarters for the native carrier line based there. The living quarters were made of a timber frame surrounded and covered by sisalcraft as protection against the rain. At first the total number of natives employed was perhaps six hundred, but as the advance progressed and additional troops were moved in, the numbers grew to over nine hundred. Each day a loaded line moved forward to the next post, returning the same day empty-handed, the time taken being an average of seven hours for the double journey. Forty pounds was the maximum any one man could carry, this weight being decided on by virtue of the difficulties of movement over the steep rises and descents, the mud and the rain. These restrictions complicated the " Q " problem, as the number of natives available was seldom equal to the amount of supplies to be taken forward and priorities had to be laid down. If there were wounded men to be evacuated to Wau for air transport to the base, natives had to be sent up the line without a load to carry the stretchers back ; carrying loads each way was too great a strain. A stretcher case often required twelve natives, four to carry and two reliefs of four, and these numbers had of course to be deducted from those available to take supplies forward. In addition, provision had to be made for natives going sick and for much needed days of rest.

Each day when the natives were marshalled and told to pick up the loads which had been prepared for them, they invariably scrambled for the smallest package. They always failed to realize that a small box of ammunition might weigh the whole forty pounds while a tin of biscuits, though more bulky, weighed only twenty-six pounds. Then the line moved off, generally under two escorts as some protection and as a precaution against thieving, although this seldom happened as the New Guinea native is reasonably honest. Distance was never measured in miles during the campaign, but in so many hours walking, and all calculations were made accordingly. Usually the system worked well but sometimes the unexpected happened, generally in the forward area. The native, although personally quite brave, did not like bombing or artillery fire and if he found himself near either he sometimes " went bush " for twenty-four hours or more. This meant that a complete carrier line might disappear and not be available for the next day. On the other hand he did not seem to mind small arms fire, and later on as the upper hand was gained he became more used to bombs. Fortunately we had air superiority, and the two mountain guns the Japanese possessed were captured early in the campaign. It is interesting to note that our own mountain guns, also two in number, were 3.7 howitzers of pre-1914–18 War vintage, and they did sterling work. Moving them up was a severe task for the battery concerned, and as assistance it was given some fifty natives for each gun.

In general, therefore, we can see that the native porterage method of supply presented the staff with the following problems and abnormalities :—

1. The inadequate number of natives available, although additional ones were constantly recruited.

2. The necessity and often the extreme difficulty of deciding the priority of supplies, which of course varied from day to day and according to the vicissitudes of the campaign.

3. The fact that the native could carry only forty pounds and that only one way. To bring down wounded men or damaged stores he had to go forward without a load.

4. The occasional unreliability of a "line" if shells or bombs were falling in the vicinity.

5. The difficulty of signal communications. Wireless was normally adequate, but the telephones along the L. of C. from Wau to the forward units frequently failed owing to damage by falling trees, other breakages, weather and faint reception.

6. The natives' strong objection to carrying Japanese wounded. The number of Japanese prisoners, wounded or otherwise, was small; but special escorts had to accompany natives carrying enemy wounded as there was a tendency to throw them over a cliff or kill them by other means.

7. The continual need to reduce the time lag between the moment units indented for stores and their delivery. For example, when the front line was at a distance of twenty-five miles or so from Wau, as the crow flies, the time lag was approximately four days.

Once progress North of Wau had been made it was obvious that the forward troops—usually one battalion with a second one in support along the L. of C., together with ancillary units—could not be maintained by native porterage alone. Numbers and time did not allow of this, and attention was directed to the supplementary method of air-dropping.

Air Dropping.

New Guinea was among the first battle areas in which the dropping of supplies from the air was practised, and in early 1943 the technique was still undeveloped; perforce much had to be learned by trial and error. At first the drops were free, *i.e.*, without parachutes. The aircraft used were Douglases piloted and manned by Americans, but with Australian "droppers." They were loaded in the early morning at Port Moresby in accordance with requests wirelessed by the headquarters "Q" staff; they would then fly to Wau, a certain number landing and discharging there, while the remainder went on to the dropping grounds. Above these the aircraft, usually four or five in number, circled low, and each time the pilot judged the moment was right he switched on a red light in the body of the plane. Meanwhile the droppers had arranged the cargo in lots near the door which was opened and on the appearance of the red light they either pushed the stores out by hand or lay on their backs and kicked them out. The dropping grounds were mere clearings in the jungle at appropriate spots and were very small.

On the goods being dropped they were collected by natives under A.S.C. supervision, stored and subsequently issued. Later, parachutes were introduced and this ensured a much better "recovery" as well as giving a wider range of articles which could be dropped. Strangely enough the parachutes used were of different colours, although this did not mean anything or indicate that any special type of supply was being dropped by parachutes of a certain colour. The Japanese however thought it did (they were frequently in a position to observe our dropping and in a bad drop the

supplies landed in their area). A captured document revealed that a staff officer had been diligently noting the various colours and trying to discover what they signified. He gave himself a Herculean task and must have undergone some puzzling and depressing times, as the combinations were purely fortuitous.

Dropping of supplies by air in jungle is by no means simple and its difficulties and peculiarities as they affected the "Q" staff may be briefly summed up as follows:—

1. Weather.—In New Guinea clouds, mountain mists and rain are features of the climate. Morning flying and dropping could usually be undertaken, but there were many days when weather conditions did not permit.

2. The threat of enemy fighter planes. Douglas transports were easy targets and consequently had to be protected by Allied fighters. These latter were limited in range, which meant that transports landed at Wau could not stay long unloading nor could the others delay when engaged in dropping. Accuracy may occasionally have suffered from this fact.

3. Limitation of the type of supply.—Liquids, certain types of ammunition and fragile stores could not be dropped free, and very often not by parachute, so this restriction had to be borne in mind when working out the maintenance programme.

4. Breakages and losses.—A certain proportion of the items and packages dropped either broke on landing or else fell away from the open space of the dropping ground into impenetrable jungle or sometimes into Japanese hands. This proportion varied daily, generally being about 20 per cent., but on occasion reaching as much as 65 per cent.

5. Pilot's skill.—The standard of recovery depended greatly on the skill of the various pilots. An experienced one would be extremely accurate, but sometimes a new or relief pilot would approach the dropping ground from the wrong angle or misjudge the moment at which he signalled the drop, with resulting loss. The introduction of parachutes reduced these risks, but even so substantial losses still occurred.

Thus daily maintenance was always uncertain and the means of effecting it precarious; the task of building up reserves was long and they more than once reached a dangerously low level.

This Wau to Salamaua part of the New Guinea campaign is of interest as during it, for the first time in war, sizeable forces were maintained from their base entirely and exclusively by air for months on end, and many of the lessons learned then were later put to good use in other Pacific areas and in Burma. In addition, the way in which, in many parts of New Guinea, the native carrying organization took over the functions of first and second line transport is of itself a fascinating study. Much credit is due to these men who worked so faithfully, often at considerable cost to themselves.

RECOLLECTIONS OF AN AREA COMMANDER IN AFRICA

By "ATHOS"

AS commander of an Area in West Africa for several months when the expansion of our African forces was in its early stages, the writer was involved in interesting events, some of which are told in the following paragraphs. But the intention is also to relate some experiences as an Area Commander in Algeria where the circumstances were entirely different. Both the Headquarters with which the writer was concerned had a full complement of Service representatives and their staffs, on the whole larger than those of a division. One or two reflections have been added where it is thought they may be valuable.

WEST AFRICA

The writer took over the Gold Coast Area in February, 1941, six months after we had begun to raise a new army in West Africa. The Regular units belonging to the Colony, expanded into a brigade group, went to East Africa before the Italians declared war, and a new battalion, raised after mobilization, had just gone to Gambia. This left only a local Territorial battalion, much in need of reorganization and training, the Infantry Training Centre, with its regular staff, and an embryo coast defence and anti-aircraft unit.

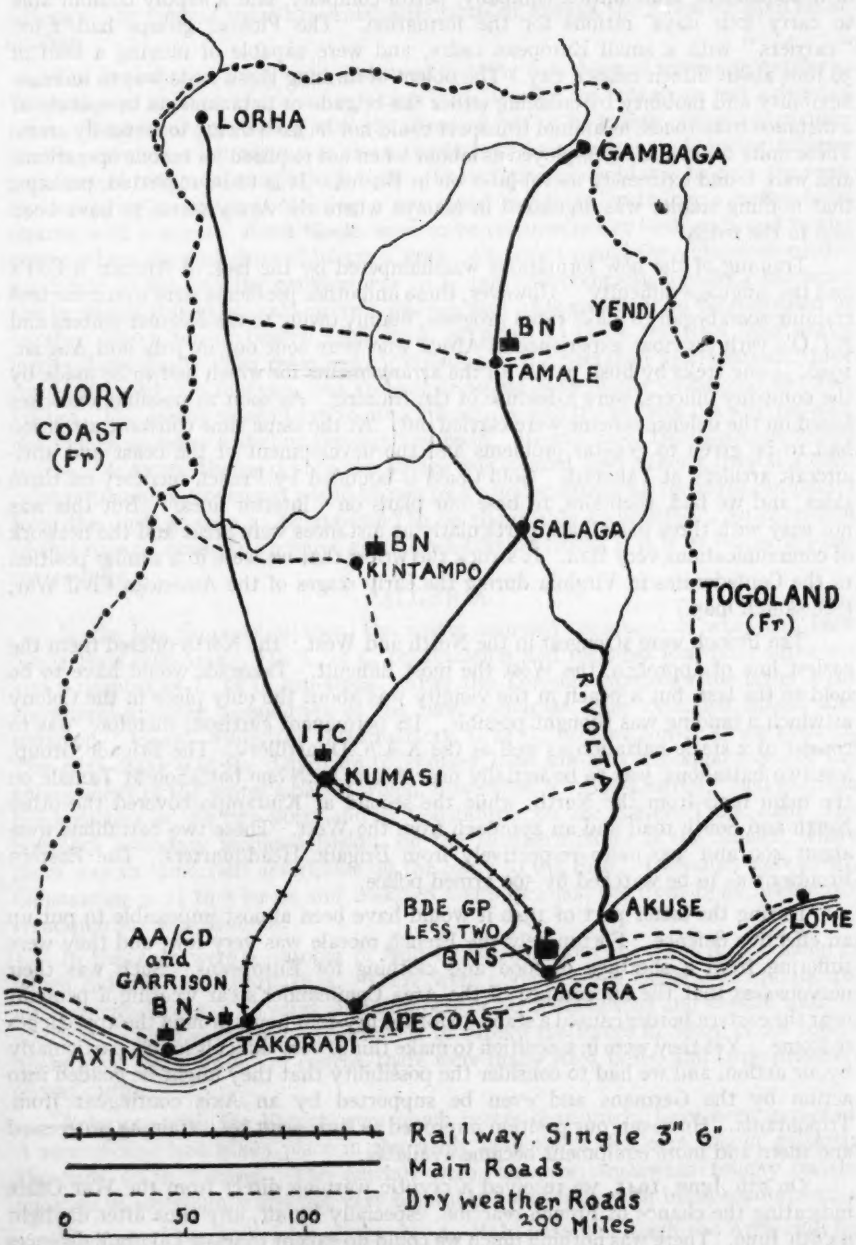
The war must have seemed very distant to most of the officials and traders; in fact there was a considerable amount of apathy, except on the part of the Governor. The files in the Secretariat still wended a leisurely way with their non-committal minutes, and the week-end drink parties at the clubs went on as usual. There was no black-out and, until the G.O.C. succeeded in infusing a sense of urgency into officialdom, things were much the same as they appear to have been in Singapore. It should be added that, from the outset, the Medical and Public Works Departments were most helpful and efficient.

The Area Commander was responsible for the defence of the Colony, local administration, and the raising and training of the new troops. These consisted of a brigade group with ancillary and garrison units. A coast defence and anti-aircraft unit, forming in Sierra Leone, was intended for Takoradi—one of the few ports in the West African Colonies where ships could come alongside, and now of increased importance as crated aircraft were discharged there, assembled, and flown to the Middle East. The Area Headquarters included a Second-in-Command who, in the event of the brigade undertaking active operations, would command the static troops and perform the functions of a L. of C. Area Commander.

The West African brigade groups were designed for service in tropical Africa where larger formations were not considered suitable. The composition was:—

Headquarters and Signal Section.
Three battalions.
Light battery.
Field company.
Field ambulance.
Group, Army Service Corps.
Group of Pioneers.

A reconnaissance company, with machine gun carriers and armoured cars, was added later. The infantry battalions were very strong in riflemen, and their armament included six 3 in. mortars. The light batteries were armed with 3.7 in. howitzers, either carried as head-loads or in lorries. The Army Service Corps groups consisted


LORHA
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ITC
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0 50 100 200 Miles

of headquarters, ammunition company, petrol company, and a supply column able to carry four days' rations for the formation. The Pioneer groups had 1,500 " carriers " with a small European cadre, and were capable of moving a load of 36 tons about fifteen miles a day. The object of forming these units was to increase flexibility and mobility by enabling either the brigade or detachments to operate at a distance from roads, as animal transport could not be used owing to tsetse-fly areas. These units could also be employed as labour when not required for mobile operations, and were found extremely useful later on in Burma. It is to be regretted, perhaps, that nothing similar was organized in Malaya where the Army seems to have been tied to the roads.

Training of the new formations was hampered by the lack of African N.C.O's and the language difficulty. However, these and other problems were overcome and training soon began to make rapid progress, mainly owing to the Regular officers and N.C.O's with previous experience in Africa who were sent out in July and August, 1940. Long treks by bush paths, all the arrangements for which had to be made by the company officers, were a feature of the training. As soon as possible, exercises based on the defence scheme were carried out. At the same time constant attention had to be given to general problems and the development of the coast and anti-aircraft artillery at Takoradi. Gold Coast is bounded by French territory on three sides, and we had, therefore, to base our plans on " interior lines." But this was not easy with three battalions, particularly as distances were great and the network of communications very thin. It struck the writer that we were in a similar position to the Confederates in Virginia during the early stages of the American Civil War. (See sketch map.)

The French were strongest in the North and West ; the North offered them the easiest line of approach, the West the most difficult. Takoradi would have to be held to the last, but a beach in the vicinity was about the only place in the Colony at which a landing was thought possible. Its permanent garrison, therefore, was to consist of a static battalion as well as the A.A./C.D. artillery. The Brigade Group, less two battalions, was to be initially near Accra, with one battalion at Tamale on the main road from the North, while the second at Kintampo covered the other North and South road and an approach from the West. These two battalions were about 400 and 300 miles respectively from Brigade Headquarters. The Eastern Frontier was to be watched by 500 armed police.

During the latter part of 1940 it would have been almost impossible to put up an effective defence. Fortunately the French morale was very low, and they were suffering from a shortage of food and clothing for Europeans. Such was their nervousness that the appearance of the Area Commander's car wearing a pennant near the eastern border caused a stand-to for twenty-four hours around the approaches to Lome. Yet they were in a position to make things very difficult for us, particularly by air action, and we had to consider the possibility that they might be goaded into action by the Germans and even be supported by an Axis contingent from Tripolitania. However, our position improved as time went by ; training progressed and more and more equipment became available.

On 7th June, 1941, we received a cryptic warning direct from the War Office indicating the chance of French reaction, especially by air, any time after daylight on 8th June. There was nothing much we could do except to warn Takoradi defences and units elsewhere to be prepared for air attack, and the Brigade and Police to be ready to act in accordance with operation instructions already issued. Next day we

heard of the invasion of Syria, but the local French remained steeped in their usual lethargy. In view of what happened afterwards in Malaya the following may be of interest.

The French had a few light armoured fighting vehicles and mountain artillery. We possessed no armour and no anti-tank guns, though the battalions had anti-tank rifles. Some means of dealing with the situation had to be found. In one particular training exercise a battalion was given the task of denying to an advancing column a main road running through thick bush. The solution adopted was to deny the road by occupying a village containing a few stone buildings, including a native-built church with a tower. Road blocks were to be constructed at both ends and in the centre where the church would form a keep. Clearings round the village afforded a good field of fire and the garrison was to be one rifle company plus four mortars; the battalion transport, anti-aircraft platoon and odds and ends to be concealed in another village ten or twelve miles back, prepared to block the road with heavy lorries if necessary. The main body consisting of the battalion headquarters, three companies and two mortars, was to operate *in the bush* in the vicinity of the first village. The enemy would have to attack frontally and try to force his way through the village or make a detour through the bush. In any case, the opponent would not be able to use the road until the village was cleared, and either a frontal attack or an outflanking movement would be met by a counter-attack by the three companies from the bush as soon as he appeared to be thoroughly committed. An operation of this nature, however, requires good, bush-trained troops if it is to be carried out successfully.

ALGERIA

In the late Summer of 1943, the writer assumed command of what had been No. 4 Base Sub-Area. The L. of C. organization had included four base sub-areas and a number of L. of C. sub-areas. After the Tunisian campaign the latter went elsewhere, and the boundaries of the base sub-areas were extended inland and renamed "Areas," whilst the Headquarters, L. of C., became North Africa District. The next stage was the departure of another base sub-area headquarters and the enlargement of the writer's parish which, now called a "Sub-District," had garrison headquarters in the two ports and at Constantine on the Algiers–Tunis road. The Southern boundary included Biskra, on the Northern fringe of the Sahara, where there was an important aerodrome on the route to the East. Distances were great. Constantine is 2½ to 3 hours and Biskra 8 hours in a fast car from Bone, where our Headquarters was situated.

In the Area were a number of field formations from the First Army, some of which did not leave until 1944. There were about twelve General Hospitals, reinforcement depots of all arms, and numbers of big installations and depots, most of which were busy re-orienting themselves to supply the forces in Sicily or for future operations. In addition, of course, there were many Area units, and large prisoner-of-war camps.

Relations with the French were much better than might have been expected. A resurrection had taken place in the Army, and the XIX Corps fought gallantly alongside us in Tunisia. The officials were, however, somewhat touchy on the question of sovereignty and not very helpful in connection with black marketeers.

Part of a French division on its way to Italy passed through the Area and, for what were presumably political reasons, all arrangements for their accommodation, etc., had to be made by us. They had come through from Syria and West Africa,

had fought with the Eighth Army in Tripolitania, and, consisting of Marines, Foreign Legion and Tirailleurs Senegalaise, were the smartest French troops the writer has ever encountered. The senior officers were hard-bitten Regulars of the Colonial Army, some deficient of parts of their anatomy, but fine soldiers. The units settled rapidly into their allotted bivouac areas, gave no trouble whatsoever, were very co-operative and extremely grateful for what we were able to do for them.

As the Area included one major port, and another used for personnel moves, as well as a number of G.H.Q. installations, the writer had considerable experience of the working relations between general and local administration. The duties were carried out as laid down in Field Service Regulations, with few minor modifications but, in practice, much more responsibility is thrown on the local commander than would appear from a cursory reading of the manual.[1]

The provision of transport and labour for port-working and its economical employment were of major importance—there always seems to be a shortage of both. Close co-operation between "Q" and the local representatives of Movement Control and the services, as well as continual supervision by the commander, is essential if efficiency is to be obtained. A daily conference settled allocations, and was held at a time which allowed all concerned to make their arrangements for the following day. In the case of transport a system of timing and checking the movements of vehicles in and out of the docks, and to and from delivery points, was necessary. By adopting a suitable method journeys could be watched and delay at any particular depot, etc., discovered.

The accommodation problems were many; they varied from finding bivouac areas for field formations to sites for large installations, hospitals and prisoner-of-war camps. Static troops were partially billeted in large houses but the majority lived in camps. Certain depots and some hospitals were accommodated in large buildings with additional hutting; others had to be built, and more than one was only just completed when the thinning out process started. One of the difficulties was, and will be in future, the provision of covered space for ordnance depots carrying the multitude of items they are now forced to hold. It is worth remembering that if a tented hospital, or similar installation, is likely to be hutted at a later stage the site should be so chosen that the building can be done outside the tented area and not in the middle of it, otherwise the work takes very much longer to complete and the noise, movement, dust and presence of labour in the occupied portion are most undesirable.

Much Arab labour was employed in addition to the British Pioneer units, and when the latter were withdrawn for service elsewhere they were replaced by companies of Italian prisoners. These "Co-operators," as they were called, were formed into units with tiny British Pioneer cadres, and on the whole did much better than was expected, particularly the skilled workmen. It was noticeable that they responded to decent treatment, but they had to be practically confined to their camps when not at work owing to French susceptibilities. As with transport, "Q" must so control the allotment of labour that available resources are distributed to the best advantage and can, if necessary, be quickly concentrated on priority tasks. In the writer's Area the Pioneer Group Commander was used as an adviser to ensure that employing services kept their demands within reasonable limits, and to see that they made the best use of the manpower supplied.

[1] See "Field Service Regulations," Vol. I, 1939, Sections 10–12.

One of the major causes of trouble of all kinds was the black market. Its ramifications were such that it was impossible to get the effective co-operation of the French authorities. The prices obtainable for certain commodities were so high that Arabs and others were prepared to take great risks to secure them. They raided depots; removed the roofs from railway trucks *en route;* broke into billets; and stole from lorries by various clever tricks. They were always on the watch and seized every opportunity afforded them by ignorance or carelessness.

An alarming factor was the demoralizing effect on a proportion of the troops who not only sold their kits and goods purchased in the canteens, but in many cases stole from stores and dumps. Deserters lived by stealing and black market dealing, sometimes on a large scale. Drafts of newcomers travelling by rail were the special prey of Arab touts, who also infested the main roads waving bundles of notes and shouting to passing vehicles: "Bizniz, Johnny." The Special Branch of the Military Police did excellent work, and a certain amount of property was recovered by counter-raids, but in many of these we were hampered by lack of co-operation, or worse, on the part of some of the authorities. Strenuous efforts were made to combat carelessness, to tighten up interior economy, and to influence opinion amongst the troops against these practices. Units varied in this respect as in everything else. Raw troops were always a problem; they were much too friendly and it took some time before they learnt that the local Arab does not make a good pet. This attitude annoyed the French who had no illusions on the subject.

There were continual rumours of Arab unrest, and there seemed to be no doubt that the Arabs were doing a thriving trade in arms picked up on the Tunisian battlefields or stolen elsewhere. Our opinion was that there might be trouble as we thinned out, when less labour would be employed and there would be fewer opportunities for stealing. It was a delicate situation so far as we were concerned; we were not responsible for the internal security of the country though we had to safeguard our own troops and the large accumulations of stores. Fortunately our relations with the local French commanders were excellent. A rising did take place in May, 1945, after we had withdrawn from everywhere except Algiers, but it was promptly and very firmly dealt with. *La Légion* appeared on the scene very quickly!

In the writer's opinion the Military Police deserve great credit for their achievements in traffic control and in helping to maintain discipline and order, often under very difficult conditions. All sorts of queer tasks fell to their lot, including counter-raids and searches to recover stolen property. One incident which occurred in the Area commanded by the writer had its humorous side. One night, the Field Security Section, apparently exhilarated by fantasies of their own creation, imagined they were being attacked, and opened fire with automatics from their billet in the town. It was, of course, the Military Police who quickly put a stop to the nonsense and pacified the local French. The incident did not increase one's regard for the Security people, who were never very impressive, but it did show the quiet efficiency of the Military Police.

One of the difficulties of an Area Commander, particularly when his parish is very extensive, is the number of units under direct command when he has no subordinate commanders under him. At one time in Algeria our distribution list was over 200 which put considerable strain on the staff, services and clerks. Field formations in the Area were no bother at all and invariably co-operated in every way, but other birds of passage, such as units of various "private armies," were apt to consider themselves above the law.

Our task in Algeria was facilitated by the attitude of District Headquarters who, having issued policy instructions, allowed us liberty of action in carrying them out. Once a superior formation interferes in details, trouble begins.

CONCLUSION

Many things have perforce been omitted from this sketch but the writer hopes sufficient has been included to give some idea of the diversity and interest of the tasks which confronted two Area Headquarters. The situation in West Africa was unusual, and the writer's headquarters in Algeria was really a L. of C. formation. But, even so, it will be seen that the duties involved were very much wider than those contemplated in the Regulations, though one must always be prepared for this.[2]

There have been a good many references to "co-operation" in this paper. Much depends on the ability of a Headquarters to obtain the willing co-operation of all and sundry, especially those not "under command."

Finally the writer would like to emphasize the value of Field Service Regulations, Vol. I, to an Area Commander overseas and his staff. It proved to be "guide, philosopher and friend" in the heterogeneous matters which had to be dealt with and the varying circumstances which arose. Some modifications in the methods laid down had to be made to meet special local conditions; that is inevitable. But the principles expressed remained in general application, and when improvisation was necessary were a firm base from which to start.

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[2] See "Field Service Regulations," Vol. 1, 1939, Sections 11–12.

THE MILITARY PAPERS OF FIELD-MARSHAL SIR GEORGE NUGENT, BT. (1757-1849)

By T. H. McGuffie

(Reprinted from No. 64, *The Bulletin of the Institute of Historical Research*, University of London.)

THE military papers of Sir George Nugent in the Manuscript Section of the Royal United Service Institution Library consist of fourteen well and uniformly bound large volumes, presented by a later namesake in 1923 and 1924.

Although the Field-Marshal's military service was of exceptional length, this collection deals only with the period from 1792 to 1815; and even this portion of his career is not exhaustively covered in more than 3,000 pages. With very few exceptions, the papers are of the non-personal type which collect automatically in the files of Adjutant-Generals and military commanders.

George Nugent, related to the family of the Duke of Buckingham, was a Regular soldier from the age of sixteen. He saw service in the American war, and became a staff officer in the early part of the French wars, Ireland being his station from 1796 to March, 1801. He then spent five years as Commander-in-Chief in Jamaica, returning home for short spells in charge of the Western and Kentish military districts before becoming Commander-in-Chief in India in 1811. His term of office there was short, as there were certain undefined limits to his post which he found impossible to overlook when Lord Moira went out there. At various dates between 1790 and the dissolution of the last unreformed Parliament in 1832 he served the family interest in the seats for Aylesbury and Buckingham. His wife, Maria, daughter of the Attorney-General of New Jersey, wrote a celebrated diary of her time in Jamaica.[1] By sheer survival, Nugent reached the rank of Field-Marshal in 1846.

In the papers there is little trace of his activities outside the military sphere, and little indication of his private life beyond a reference to the bad health of his wife, which he pleaded as an additional reason for resigning his post in India in 1813. The existing papers, however, give a broad view of British military activities over an important period and in widely different spheres.

Three volumes cover the Irish period, with a few returns overlapping between 1792 and 1804. There is fresh and startling proof of the danger to British interests there. The determined hostility of the bulk of the population, the bad discipline of British Regular troops, the brutal ignorance of the Yeomanry and Militia officers, and the penal laws and terror-inspired terrorism of the Government are clearly shown. Letters from informers give the names, relatives and home towns of the members of the Irish Committee in Paris; spies, drowned friars, unrest and mutiny figure alongside accounts of lawless behaviour and disregard of orders by some Regular officers too long stationed in Irish billets to be aware of their duties and responsibilities. Evidence of open "United Irishmen" propaganda in the Cavalry (leading

[1] Lady Nugent's *Journal of a Voyage to and Residence in . . . Jamaica . . .* 1801 *to* 1805, *and subsequent events . . .* 1805 *to* 1811, was privately published in 1839; three editions were later published at Kingston, Jamaica, in 1907, 1934 and 1939. The book gives a lively and spirited account of the Lieutenant-Governor's household, its private affairs, travels and public functions in Jamaica; and also contains interesting notes on the state of India from 1811 to 1814.

to the disbanding of an old and famous regiment, the 5th Royal Irish Dragoons), of bad practices and corruption, add point to copies of Abercromby's General Orders of 1798, wherein he declared that the condition of the forces was so appalling as to render them " formidable to every one but the enemy." The constant fear of French invasion is evidenced by many pages of instructions, repeated and brought up-to-date almost monthly, for mustering and marching in case of a French landing; by many naval reports giving warnings of possible attacks and hostile fleet movements; by copies of secret flag recognition signals to be exchanged between H.M. ships and shore stations; by accounts of papers taken in French vessels captured off the Irish coast; and by private and confidential review and inspection returns.

The Fencible regiments, while " extremely regular and well conducted in their quarters," and " much respected by the loyal inhabitants," were also very varied in their discipline and appearance, without regulation uniform except coats, unable to perform the field exercises properly, full of old and short men, with too many boys, and their accoutrements bad. The Militia were seething with treachery and mutiny, and at loggerheads with the Yeomanry over religious matters; Nugent filed copies of seditious handbills circulated in 1797 amongst the garrison of Dublin and the North Mayo and Limerick Militia regiments advising passive resistance to orders until pay and subsistence money were increased. An attempt to use military bodies for propaganda against the Irish Union is recorded in the suspension of the Marquis of Downshire from command of his regiment because of a petition opposing " a measure now under discussion in Parliament " in January, 1800. The Yeomanry itself, though it might do at a pinch to protect depots against insurgents and even provided " a few select corps under the direction of young men of High Rank " who " might wish to attend the Army," inspired no confidence in the British Generals as to its ability against French troops.

When the French did in fact succeed in landing 1,100 men under General Humbert at Killala in August, 1798, Nugent's letters from the field, instructions for brigading the battalion guns, and accounts of the overthrow of large British forces at Castlebar (illustrated with a useful and informative sketch-map)[1] testify to the influence the ex-merchant of rabbit skins managed to exert before being overwhelmed. The melancholy aftermath of the rebellion and invasion is shown by Castlereagh's orders for the assembling of courts-martial, the details of martial law, orders for transporting for life men found in possession of guns, and instructions to send rebels, if sentenced to transportation, to Prussia to be enrolled for foreign service. There is also much paper concerning barracks and their construction, and many weekly strength returns giving names and numbers of regiments, their quarters and stations. One return of officers absent without leave, lists 27 Regulars, 11 Fencibles (including one Lieutenant-Colonel) and 15 Militia (of whom one was a full Colonel). Foreign troops also figure in the returns; in 1801 there were over 4,800 Dutch troops in Ireland, including riflemen, two battalions of light infantry, and four of foot.[2]

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[1] See T. H. McGuffie, " A sketch map of Castlebar, 27th August, 1798 " (illustrated) in *Journal of the Society for Army Historical Research*, xxvi, no. 107, p. 88.

[2] These Dutch troops consisted largely of the Emigrant Brigade, formed from the troops who had rallied to the Orange Flag during our expedition to North Holland in 1799. The Brigade was disbanded at the Peace of Amiens. See C. T. Atkinson, " Foreign Regiments in the British Army, 1793–1802," in *Journal of the Society for Army Historical Research*, xxii, no. 90, 234–7.

The lighter side of Irish life finds some reflection in the case of an officer attempting to carry off by force "a young lady of fortune," an account of a monstrous floating island said to be in preparation by the French for future invasion, and a petition lobbying for the retention of the job of washerwoman at the Royal Hospital by a family which had apparently held the post for generations and was loath to let it go. It is also noticeable from several circulars and a report on the health of the Militia and Fencibles in Ireland (the annual mortality between 1795 and 1800 was as low as 1 in 79) that these men made excellent recruits by reason of their peasant background, their active habits and their well-nourished state. At certain times recruiting was opened for volunteers from Irish home defence units for specified regiments of the British Line, both horse and foot; additional bounties were given, and some first-rate material went into the ranks which proved on many a hard-fought field far from Ireland how brilliantly the Irishman could fight.

The Jamaica volumes total six, though of these two are not directly connected with Sir George Nugent's period there as Commander-in-Chief. One is a complete memoir on the defence of Jamaica, drawn up in 1782 by Major-General Archibald Campbell; the other is the Regimental Hospital Book of the 19th Foot, at Stoneyhill Barracks, Jamaica, from January, 1789, to April, 1791. The four volumes directly concerned with Nugent are collections of correspondence bound for the years 1802 to 1805, with a few earlier and some later papers. Campbell's memoir of 1782, drawn up for an attack anticipated in that year, opens with a brief historical account, describes the geographical features, and records a population of 23,000 whites and 255,000 negroes. Besides laying down full defence arrangements, orders for mustering, signals, provisions, depots and posts particularly favourable to an invader, a good complete description of the entire island is given. The harbours, towns, roads, rivers, forts and interior are individually considered and examined. There is no map in the volume, but the study is workmanlike and thorough. The 19th Foot Regimental Hospital Book gives 596 entries, mostly fever, in 28 months. Sixteen venereal and 21 punishment cases are recorded. Name, age, date of admission, where quartered, disease, and date of death or discharge are listed; five fatalities appear, one of inebriation five hours after admission. The punishment cases show no particular pattern in the dates of infliction; sometimes a three months' gap is followed by admissions on succeeding days; a few days was the usual length of confinement, though one man was in hospital for six weeks; one soldier is responsible for two entries, another for three, and the desperado of the regiment for six, so that three men contribute over half the recorded instances where the normal floggings ended in hospital.

The four volumes dealing with Sir George's normal work as Commander-in-Chief in Jamaica contain originals and copies of the bulk of official business (with the Horse Guards, War Office and Downing Street), "in" and "out" letters, official despatches, regimental matters, promotions, transfers, troop movements, courts-martial, hospitals, barracks, ship movements and relations with the House of Assembly. The ebb and flow of the war is vividly illustrated; and additional interest is given by the inclusion of some private notes and out-of-the-way curiosities. One document, from the pro-British Mosquito Indians on the mainland, gives their opinion of the war of 1802, information as to the election of a new King, and requests arms, cloth, pistols and swords in case the Spaniards attacked them; the General Marshal, Generals, junior officers and an Admiral, all boasting good English names, make their respective marks; a subsequent list, of 1804, includes rum, shirts, pins, fish-hooks and coloured handkerchiefs amongst the items sent out to keep them in good humour.

Many of the early communications from London show the usual eager desire to reduce to a peace establishment, at a time when few people in authority honestly thought anything but a short truce possible. By late 1803, however, Nugent's letters and despatches are full first of possible French attacks by sea, then of the enemy capitulations in the West Indies. Nugent reckoned, from information received from captured officers, that the French by the Summer of 1803 had lost not less than 60,000 men, including seamen, since their first landing. In San Domingo they had "universally tyrannized over, oppressed and plundered the Proprietors"; hundreds of foreigners, particularly Poles, had deserted and were fighting against their former masters in the brigand armies, while from the prisoners Germans were recruited for British regiments in considerable numbers. The French ventures in the West Indies came in truth to dreadful calamity and disaster. Towards the end one French General, Sarrazin (who had been with Humbert in Ireland in 1798, and proved himself an alert and daring officer) proposed taking the last 4,000 fit men and staking all on a final desperate onslaught on Jamaica itself; when this plan was rejected, he retired in disgust first to Cuba and then to America. By December, 1804, Nugent had over 7,000 fever-smitten prisoners on his hands; at the end of 1806 there were nearly that number still on the island, in prisons and hospital ships; nearly 2,000 were Spaniards. Copies of the various Articles of Capitulation are bound in with returns and comments from Port-au-Prince, Aux Cayes, and Cap François; Nugent was strongly in favour of leaving the brigand government in power, though he deplored the cupidity of Royal Naval officers in stripping bare the captured French magazines instead of dealing fairly with the natives, whose unremitting pressure on the leaderless and dying French had been so useful.

In the early days of the renewed war there were suggestions that a fresh attack might be made on the Spanish-American mainland. An expedition sent in 1780 had failed; the causes of this failure are analyzed; and Nugent collected maps and recently-returned travellers, purposing to send two expeditions of 3,000 men each, one by Rio San Juan, the other by Rio Dolce to Guatemala and Lake Nicaragua, in the event of war with Spain. Apart from San Domingo, however, the most important event of the first years on the Jamaica station was Admiral Duckworth's sudden dash and complete failure against Curaçoa in January, 1804. This unfortunate example of naval lust for prize-money was undertaken in complete isolation from Nugent, who declared, "I knew nothing," and that the expedition was "a most extraordinary occurrence, considering not only the good of the Service but the general good understanding we have been upon ever since we have been colleagues."

In 1805 greatest interest attaches to the effect on Jamaica of the French fleet movements which culminated at Trafalgar. News of the Toulon fleet at sea was reported at once to Nugent from Downing Street; the British fleet in the West Indies was concentrated, and reports that the French had some 4,800 troops aboard led to Sir Eyre Coote with ten regiments being despatched to Jamaica. In September, 1805, there were 4,000 rank and file in the island, of whom over 500 were sick. After various alarms and excursions and tentative diversions to Madeira and Barbados, Coote finally arrived at Jamaica in January, 1806, when Nugent, who disliked dealing with the troublesome Assembly and the constant wrestle going on over paying for the military establishment, handed over and came home. His official resignation was held up by the news of the French fleet movements, neither Lord Camden nor Nugent himself desiring to change at such a critical time.

In these volumes there is a good deal of interesting matter concerning military promotion and discipline, and some useful particulars of barracks, hospitals, sickness

and medical staffs. The hospital staffs were almost always under strength; in 1802 there were in Jamaica only one Assistant Inspector and 16 hospital mates, besides regimental surgeons; but as most regiments were incomplete, and some hospital mates were infirm or sick, the remainder, apart from one acting as storekeeper, were out assisting the regimental hospitals; in 1804 the medical establishment of the island was eight assistant surgeons short, though in that year mortality was low; at Up Park Camp, for instance, there were only 12 deaths in June, July and August, as against 55 in the corresponding months of 1803.

One unusual letter shows Nugent perplexed at the arrival of 500 pipes of wine; he enquired whether it was for the troops, saying that they generally received rum, while in hospital port was supplied from a special fund inaugurated by himself. It is unexpected to find a British officer of the period embarrassed by a superfluity of drink. Certainly the disciplinary reports show that many officers flew only too readily to the bottle. Nugent declared that all the Royal Artillery officers in Jamaica were "useless"; they had been there too long, and were too relaxed in their professional attitude; many officers were absent without leave "for a very considerable time, with impunity"; in Honduras, an unlucky station, sums drawn had not been spent on fuel, though the money had vanished; clothing accounts were frequently in grievous error; of one officer commanding a West Indian regiment Nugent remarked that it was "a pity that incompetent men should be at the head of corps, which is too much the case in our Service, but how to remedy the matter unless it is by keeping them away from their respective regiments I am at a loss to decide." More trouble in Honduras was reported indignantly to Nugent over the conduct of Captain Pellew, R.N., of the Sloop "Fly," in pressing men, when he took the liberty of calling the magistrates "a sett of damned rascals," resulting in a flood of affidavits and letters of protest.

Nugent had continual bother with the House of Assembly and the Council; some members were constantly absent, some so infirm as to be unable to attend. They objected to the use of black troops, and were constantly quibbling over accounts and the payment of the very considerable sums (over £305,000 a year) for the maintenance of troops. One bill of sale bound with the Jamaica papers records the payment by H.M. Government in July, 1805, of a hundred guineas for each of 24 "prime new negroe men imported in the Ship 'Trusty' from the Gold Coast."

Between the home authorities, the French, the Assembly, fever, discipline and normal military arrangements, Nugent was kept hard-pressed and hard at work, and it must have been with much relief that he returned home for a quiet year in Parliament before resuming command.

In those days to be the Colonel of a Regiment, as against a Colonel by brevet, was one of the most remunerative positions in the Army, with various perquisites, particularly as regards clothing funds. Major-Generals and even higher ranks were often mere Lieut.-Colonels as far as regimental pay was concerned, and watched eagerly opportunities to possess a regiment. Sir George Nugent was very lucky in becoming a Colonel, at 36, of the 85th; in 1806 he was made Colonel of the 6th Foot; and in one volume of the papers under review are bound documents connected with these two regiments. They are a medley of embarkation and strength returns, along with lists of officers, standing orders, the manual exercises with the rifle (and bugle horn calls), rules for the Regimental School, details of augmentation, establishment, much to do with clothing, and Nugent's public and private accounts concerning the regiments between 1794 and 1810. There is also a letter from an officer pleading

that as a new Commission would mean his ceasing to be quartermaster, this post might be granted to his 6-months old boy in order to keep the emoluments in the family, the father continuing in practice to do the work.

The volume dealing with the Western District from 1807 to early 1809 has much to do with Volunteers, local Militia, and Militia. There are 106 Volunteer units listed in September, 1807, for Dorset, Devon, Cornwall and Somerset, totalling over 22,000 under arms, and rejoicing in fancy titles—Legions, Guides, Corps and Rifles; by May, 1809, the total had sunk to under 9,000 under arms, while some groups were down to 20 and 21 men present. The formation of local Militia and the almost final end of the fear of invasion (though a record of the eighteen beacons in the area was still carefully kept) had brought this change.

One of Nugent's chief troubles in the West was smuggling, and many letters and returns deal with nightly patrols, reports, signal stations and co-operation with the Navy. The sea-fencibles and pilot-boats were frequently under suspicion, and the Scilly Isles had a specially bad reputation. The Regular troops in the West were apparently very small in number; small detachments of foot regiments and one cavalry regiment along with artillery totalled less than 2,000 out of almost 8,000 trained men permanently under arms, the rest being Militia and Veterans.

Nugent's term of office in the Kent District from July to October, 1809, very naturally reflects the ebb and flow and return of the forces sent in those months to and from Walcheren on the ill-fated expedition; on 9th July there were over 28,000 men in quarters. At the end of the period there are many returns of and enquiries about sick men, vacant beds, the state of barracks and hospitals; it was even suggested that casemates in Dover Castle should be used as temporary barracks. Other papers deal with the very heavy coastal defences in the 63 forts and batteries in the area from Whitstable to Dungeness (mounting altogether 326 pieces of heavy ordnance), and with the 27 towers, mounting each a heavy 24-pounder gun, with a heavy 5½-in. howitzer as well when erected on the edge of the cliffs.

The volume dealing with the East Indies has a very interesting long personal letter from the retiring commander, Sir George Hewitt, with a full report, dating from 1808, on the Army of over 71,000 rank and file. The rest is a very mixed grill, with returns, letters, minutes, orders from the Court of Directors; lists of staff appointments (from grass-cutter, syce and lascar to Major-General), tables of allowances (from 4.0.0. pagodas monthly for a hospital key, barrack or arrack sergeant to 2009.11.0 pagodas monthly for the Commander-in-Chief), levies, rates of batta, memoranda on the supply of horses, and the order of precedence in India as settled by the Prince Regent's Warrant of 1814. There are also papers dealing with the defence of India in the event of an outbreak of war with Persia and Russia in 1807, some private letters and accounts of the Pindaris, copies of correspondence in 1814 with Lord Moira on the Nepal War, and some observations and reports on the military establishments of Java in 1811, with notes and proposals for raising Moslem marine battalions and volunteers. It is interesting to note how few were the troops required to hold distant posts: 1,045 at Penang, 276 at Malacca in 1812.

In addition to the volumes dealing more or less specifically with particular subjects and commands, Nugent had bound together in one volume a mass of miscellaneous General Orders and Circulars, from 1796 to 1814, drawn from the Horse Guards, the War Office, the Irish Adjutant-General, Jamaica and India. Routine matters, such as the design of buttons, staff dress and the colour of cavalry horses; special orders for the disbanding of Militia regiments in 1802; volunteer acceptances;

the management of hospitals in Jamaica in 1802 (with the employment of " a decent sober woman as nurse ") ; and the composition of a mobile column in Colombo during 1814 ; these and many similar matters are to be found together.

Taken as a whole, the Nugent MSS. here described provide useful material not only for the military historian concerned with the districts and times described, but for the student of Imperial affairs, particularly those interested in Jamaica and India ; valuable social evidence is also to be found, more especially about Ireland. The papers give the impression of having been handled by a business-like and competent man of affairs, who may not have left a name to be remembered, but whose capacity, application and wide range of interests bear the marks of the administrative mind. The British Empire has had the services of many such men, often in the Army. It is very proper that their papers should be put at the disposal of the historian in one or other of our great national libraries.

THE R.U.S. MUSEUM

A TRAGIC TERCENTENARY

By The Secretary

THE Tercentenary of the Execution of King Charles I on 30th January, 1649, has focused attention on the home of the R.U.S. Museum in the old Banqueting House of the former Whitehall Palace, outside which the scaffold was erected.

There has been a good deal of argument about the exact site of this political murder and about how the Royal victim reached the place where he was done to death. Early in this Century, the late Reverend Canon Edgar Sheppard, for many years Sub-Dean of His Majesty's Chapels Royal, collected and reviewed the available evidence which, with his deductions, he published in his book *The Old Palace of Whitehall*.[1] He agrees with the conclusions of Sir Reginald Palgrave, who had already done much research on the subject, as given in a letter to *The Times* of 17th May, 1890. So far as is known, nothing has come to light since to controvert the views of these two authorities, so it may be of interest to quote from this letter.

Sir Reginald wrote :—

> " . . . it was not through a window in the front of the Hall that Charles passed out on to the scaffold. [At that time] a small building abutted against the North end of the Banqueting Hall, which in height and shape corresponded closely with the Georgian structure which contains the entrance staircase to Whitehall Chapel.[2] . . . The King had reached that small building thus : He entered the Banqueting Hall by an outside staircase, which led up from the ground to one of the windows in its East or River side—that very staircase which, on January 23, 1657, broke down under the crowd of Parliament men who pressed up to congratulate Cromwell upon the safe conclusion of Sindercombe's assassination plot. Having thus gained entrance, Charles walked down the length of the Banqueting Hall until he reached the North end wall, and before him was a doorway cut through the wall, giving entrance into a narrow room beyond ; and then, when he stood within the room, the daylight streamed in upon him through the dismantled window-opening, and he saw the way to death. . . ."

The passageway cut in the North wall has, it is believed, remained open ever since and is now the main entrance into the Banqueting Hall.

The scaffold itself was, to quote from Sir Reginald Palgrave's letter again, " carried round the front of the Hall as far as the second window." The block was, of course, on the scaffold and under either the first or second of these first floor windows—possibly between the two.

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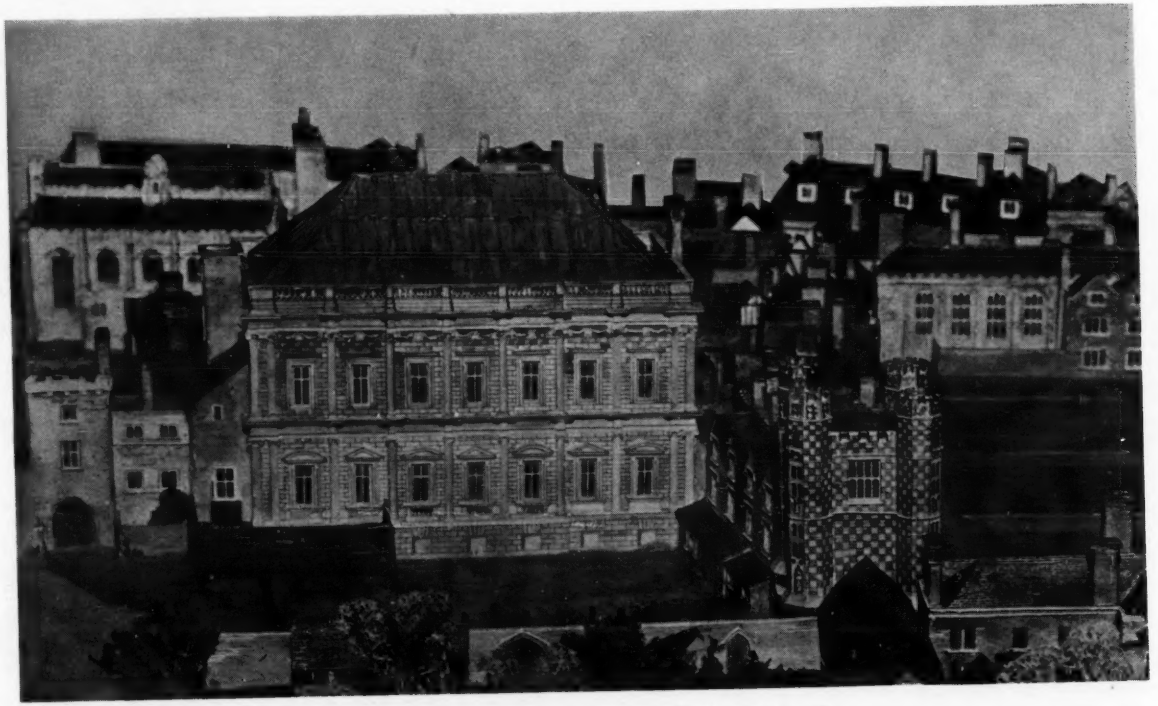
[1] *The Old Palace of Whitehall*. By Edgar Sheppard, D.D., Sub-Dean of H.M. Chapels Royal and Sub-Almoner to the King. (Longmans, Green and Co.), 1902.

[2] The Banqueting House was converted into a chapel on the Accession of George I in 1724. The face of the original " small building " was cut off and rebuilt further back to give room for the present small courtyard which is the public entrance. The building was carried up to the full height of the Banqueting House to enclose the new stairway. The historic window has therefore disappeared.



R.U.S.I. MODEL OF WHITEHALL PALACE

SHOWING SITE OF THE EXECUTION OF CHARLES I

THE MEMORIAL WINDOW

The Northern window in the Hall, which was nearest to that out of which Charles stepped and also the approximate site of the actual Execution, has been regarded as a Memorial Window ever since the use of the Banqueting House was given to the R.U.S.I. in 1893. There hangs the painting of King Charles I, after van Dyck, by J. L. Reilly, given by Lieut.-Colonel R. Shoolbred, C.M.G., T.D. The frame is made from old timber of the roof of Westminster Hall (the place of the trial). At the top is the Stuart Crown, and on the frame is Charles' mysterious last injunction to Bishop Juxon, " Remember."

In a case below this picture is a pair of gauntlets handed to the Bishop by Charles I on the scaffold, who bequeathed them to one Jeremy Taylor, through whose family they eventually came into the Landor family. They were given to the Institution by Miss C. E. Landor.

A recent acquisition has been another portrait in oils of King Charles mounted on a black horse and wearing black armour—a copy of the well-known van Dyck picture in the National Gallery. This was bequeathed to the Institution by the late Lieut.-General Sir Edward A. Altham, K.C.B., K.C.I.E., C.M.G.

A full-size figure in page's armour of the period, grasping a pike, stands sentry in the Hall with his back to the window and facing the beautiful model of Old Whitehall Palace presented by the late Secretary, Lieut.-Colonel Sir Arthur Leetham, K.C.V.O., C.M.G. This includes a true-to-scale reproduction in miniature of the Banqueting House as it was when the " small building " existed with the window and steps leading down to the scaffold.

The model shows in much detail the other and older buildings which straggled down to the River bank behind Whitehall and housed the King and Court during the late Tudor and Stuart periods. When the more modern buildings, which replaced the burnt-out remnants of the Palace, were in their turn cleared away to make room for the new huge pile of Government offices, now in course of erection, the foundations of the original buildings were uncovered and it was most interesting to see how accurately the model had been constructed.

Representatives of the Royal Stuart Society held a meeting in the Banqueting Hall on Saturday, 29th January, 1949, to commemorate this special Anniversary, and placed a wreath outside the northern window. The Last Post and Reveille were sounded at the conclusion of the ceremony.

THE INTERNATIONAL SITUATION

PALESTINE AND THE MIDDLE EAST

EVER since the evacuation of Palestine by our forces in June of last year, there has been fighting by Jewish forces with their Arabian and Egyptian neighbours, and the political repurcussions have been severe headaches for the United Nations' representatives and the Foreign Offices of most of the major Powers. Matters came to a head when it was reported that Jewish forces had penetrated ten to twenty miles into Egyptian territory and their incursions into Transjordan had caused King Abdullah to appeal to Britain, under the Anglo-Transjordan treaty, for a British force to be sent to Akaba. This, as the Foreign Secretary, Mr. Bevin, put it, " looked, on the face of it, as the beginning of another aggressive mentality."

There was some doubt about what was really happening on the Egyptian frontier, and both the British and United States Governments were anxious for accurate information. There seemed only one practical way of obtaining it, and that was for the R.A.F. to go and get it. During the first week in January, therefore, R.A.F. aircraft from the Canal Zone carried out reconnaissance flights to discover the extent of this Jewish invasion. These reconnaissances were strictly confined to the Egyptian side of the frontier and the aircrews were under orders to avoid combat. Nevertheless, on 7th January, two formations, including four Spitfires, were attacked by Jewish fighters and all the Spitfires failed to return. A few hours later a further reconnaissance, sent out to obtain information about the fate of these aircraft, was also attacked and one Tempest was reported missing. It was subsequently discovered that these aircraft had been shot down, two British officers had been killed, two baled out and were taken prisoner by the Jews,[1] one was wounded but landed in British hands. Incidentally, it was ascertained that Jewish ground forces were at least ten miles inside Egypt.

Subsequently, our aircraft were instructed to regard as hostile any Jewish aircraft encountered over Egyptian territory ; but the latter evidently thought discretion the better part of valour, and having made this unprovoked attack, remained behind their own boundary.

Meanwhile, British troops had arrived at Akaba, and put the port in a state of defence.

It may be, of course, only a coincidence, but it is significant that almost immediately after these unmistakable signs that, although we had withdrawn from Palestine, the British Army and Air Force were still *en evidence* in the Near East, things began to take a turn for the better. A truce was called between the Jews and the Egyptians and, on 13th January, talks started on Rhodes Island with the object of settling their differences. No further aggression was reported in Transjordan.

What the immediate future may hold, no man can foresee, for there are so many warring interests involved, and so far the only recognized authority for resolving them—the United Nations Organization—has proved completely incapable of doing so ; indeed, as our Foreign Secretary put it recently, the whole of their resolutions are being ignored.

British influence in the Near East is vital to the whole Empire—more so to-day than ever ; for not only does it ensure the safety of the direct sea route to India,

[1] They were subsequently repatriated.

Pakistan, Australia, New Zealand, East Africa and to our possessions and trading interests in the Far East, but strategically it is a bulwark against Russian aggression, which would threaten that route and imperil the oil supplies which are invaluable to the Western Union, but which Russia sorely needs and ardently covets. The Canal area and Middle East have, as our Foreign Secretary put it, "a tremendous importance, not only to the safety of the territory itself, both East and West, but to the safety and defence of Western Europe." "If there is any danger," he added,[2] "or when we see danger, we should react quickly." The whole teaching of military history supports that sound principle. Its latest application, even on such a small scale, seems to have had a salutary effect.

Two things, however, are essential to an effective show of force—the force must be adequate in itself and it must be clear to those Powers or peoples it is intended to impress that it is a token of stronger measures which will be taken unhesitatingly if necessary. But, to-day, the array of potentially hostile forces is such that we cannot be expected to face it alone. Internal politics at the time of the Presidential Election introduced an occasional jarring note in our relations with the United States regarding Palestine; but, happily, this phase seems to have passed, and once again we are in general accord with American policy. As our Foreign Secretary said in the speech already quoted, "... the United States Government reacted to this event [i.e., the invasion of Egypt] as determinedly as we did. The President immediately intervened and made representations as emphatic as the action we took ..."

There is, however, some risk that the mischievous antics of a half-formed and unruly country may distract attention from the wider political and strategical situation of which, geographically, it only forms a small part. It must not be overlooked that peace and security in the Near East are buttressed on the North by Turkey and Greece—nations which for years have been the objects of pressure by Russia. But for the very tangible support they have received and are receiving from Britain and the United States, this barrier might have burst with fatal results to the whole political and strategic structure. To the South, Egypt finds herself hoist with her own petard: for political reasons her government has been clamouring for years for the withdrawal of British forces, even from the Canal Zone; but with the threat of invasion by an aggressive Israel, she is unlikely to press this policy for the time being.

To the East—the Middle East—lies that vast territory stretching across Transjordan, Iraq and Iran to Afghanistan and the new Dominion of Pakistan, all strongly linked in sentiment with each other and their co-religionists in North Africa. Here it looks as if there will be an increasingly united group of nations the power and influence of which, as Mr. Bevin warned, "it would be very unwise for this country to ignore." Our prompt response to the appeal from Transjordan cannot fail to have made an impression, not only in that country, but also throughout the Middle East; but if it is to have a lasting effect there must be no more withdrawals, indeed we must be prepared to increase the support of our friends in the Middle East if need be. The oriental mind understands and respects military force; whereas sweet reasoning and political palaver are regarded as symptoms of weakness.

THE FAR EAST

The momentous events taking place in Eastern Asia, referred to briefly in these Notes in the last JOURNAL, have become a veritable cataclysm. Communist forces

[2] Mr. Bevin's speech in Parliament on 26th January, 1949.

are sweeping North and Central China like a gigantic horde of locusts and look like overrunning the whole country. The Kuomintang government, after rather abject appeals to the Communist leaders for peace terms, has practically disintegrated. Generalissimo Chiang Kai-shek, who was a notable Ally in the late war, has fled to Formosa and is now at the head of the Communist list of "war criminals" to be brought to trial.

Nanking has been deserted by all high former goverment officials and, it is obvious, will soon be in Communist hands. According to *The Times* correspondent, writing from Peking on 3rd February, the so-called Joint Administration seems to have disappeared, and control of the Peking-Tientsin area is now in the hands of five purely Communist organizations, four of which are military; the War Front Headquarters are in general control of the area, with General Lin Piao at its head.

In Peking, local papers have already started abuse of the United States, combined with violent attacks on all other Chinese political parties—typical of Moscow-inspired propaganda. Tsingtao, it is believed, is being evacuated by Nationalist troops, and Communist armies are advancing towards Hankow from the North and East.

A Communist China will revive the "Yellow Peril" menace in far more acute form, even though Japan is still under strict control. Ultimately, economics may become more important than politics, for the prosperity of the Chinese is closely linked with overseas trading, whereas the warring political factions have brought little but misery to the great mass of people for years past. This, in turn, may deter aggressive tendencies. On the other hand, the fanatics, who are the tools of the Kremlin but military and political dictators in Communist-dominated countries, are wont to treat the welfare of the people as a very secondary consideration, and we must not be surprised if the Iron Curtain is extended to enclose a huge slice of the Far East.

Hongkong

H.M. Government have already announced their intention to remain in Hongkong and to defend it if it is attacked. Internal unrest may become a cause for anxiety and need drastic action in good time.

Tsingtao

It has been reported from New York that the U.S. Navy is abandoning Tsingtao as its China Sea operating base, and the warships using that port are withdrawing to Shanghai.

Admiral Dwitt C. Ramsey, U.S.N., commanding the U.S. Pacific Fleet, has said that, if the Chinese bases are given up, the American Navy will use anchorages in Japan and in Okinawa, Guam, and the Philippines.

CORRESPONDENCE

(Correspondence is invited on subjects which have been dealt with in the JOURNAL *or which are of general interest to the Services. Correspondents are requested to put their views as concisely as possible, but publication of letters will be dependent on the space available in each number of the* JOURNAL.—EDITOR.)

THE STATUS OF SOLDIERS DROPPED BY PARACHUTE

To the Editor of the R.U.S.I. Journal.

SIR,—May I add three things to an answer given by General Gubbins to a question on the status of a man fighting behind the enemy lines ?

First, I believe a lawyer could find the answer in the Manual of Military Law. The ordinary officer cannot. This should be remedied by teaching the law on the subject to officers. The Manual should also be amended so that this aspect of the law is more easily intelligible.

Secondly, subject to the above, I hold the position to be as follows : it is a legal operation of war to bomb a munition factory from an aircraft ; and therefore if you drop a man by parachute with the explosive in his pocket you are still acting in accordance with the rules.

When the parachutist lands, providing he is in uniform, he has exactly the same status as one of a patrol which has penetrated the enemy lines. He is a soldier. He may blow up a factory or shoot a sentry ; and, if captured, he is a prisoner of war. But he must wear uniform.

When he has blown up the munition factory, which, as I argue, is legal, he may remove his uniform, don plain clothes and *evade* capture. His position is the same as that of an aviator who, after a bombing raid, bales out on enemy territory. If he removes his flying suit and exposes grey flannel trousers and a blue shirt, he improves his chance of evading capture and remains within his rights. The parachutist may do the same. Having blown up the factory in uniform he may evade capture in plain clothes. But he must also discard his military equipment. If, when evading capture in plain clothes, he shoots a sentry he is guilty of murder. If he sends a wireless message with a portable set, he is guilty of espionage.

Whether it is permissible to carry arms or a wireless set without using them is doubtful. I hold it to be illegal. But where do you draw the line ? If a wireless set is illegal, is a camera, or a compass, or even a service watch ? All this requires clarification.

Lastly, it is unsound to use parachutists from airborne divisions for operations such as these. Soldiers must be taught, when cornered, to fight to the death. They must not be taught to put on plain clothes and vanish. If that were the form, what would have happened at Bastoigne ?

M. C. A. HENNIKER,
Lieut.-Colonel, R.E.

26th July, 1948.

BATTLESHIPS' PART IN THE WAR

SIR,—I crave space to reply to the two officers who, in the November JOURNAL, commented on my article which appeared in the August number under the above title.

However much the " Royal Sovereigns " may have, at times, been a liability, they undeniably did valuable service in default of anything more modern. In the Indian Ocean in 1942 they formed the core of that often strategically effective thing, a " fleet in being." No one belittles the part played by the R.A.F. in the defence of Ceylon at that time, but I cannot agree with Group Captain Chilton's statement that the Japanese " decision to retire was *entirely* (my italics) due to the most decisive defeat that they received at the hands of the R.A.F." I submit that it was *also* due to the presence of the British fleet and, in particular, the " Royal Sovereigns." Is there any reason to suppose

that the Japanese command considered them so useless as a single quotation from *The Gathering Storm* might lead one to believe ?

As for the " Bismarck " operation, I submit that in a paper discussing the part played by *battleships* (as opposed to the *Navy*) in the War, one is under no more obligation to mention the R.A.F. than one is cruisers or destroyers. One knows that all are inter-dependent in maritime warfare to-day though one does not necessarily name them in connection with specific operations. Incidentally it was a negative report from a Fleet Air Arm aircraft which set the whole fleet moving towards its ultimate success.

The same thing applies to Group Captain Chilton's remarks on the escape of the " Scharnhorst " and " Gneisenau." But if I had included the part then played by aircraft I should, again, have mentioned the Fleet Air Arm before I said anything about the R.A.F.

Finally Group Captain Chilton quotes from a lecture by Admiral Brind to discount my statement that the Home Fleet kept the " Tirpitz " as a sitting target for the R.A.F. I submit that, on the contrary, the very first sentence of this quotation *supports* my contention : " The immediate problem facing the (C.-in-C. Home Fleet) was to put the ' Tirpitz ' permanently out of action so that the battleships and carriers could be withdrawn (from the Home Fleet) to join the British Pacific Fleet." Until the " Tirpitz " was sunk they had to remain in the Home Fleet. There they had for some three years kept her, largely ineffective, within Norwegian fiords, where she was a sitting target (I never suggested an easy one) for bombers ; those of the R.A.F. ultimately sinking her.

To Lieutenant-Commander Agutter I must apologise for my error of fact about the " Abercrombie's " presence at Walcheren. I do not dispute his arguments in support of the monitor. I would only plead that a detailed examination of the " battleship *versus* monitor for bombardment " problem would have been out of place in a paper which endeavoured, within restricted space, to survey the battleships' part throughout six years of world-wide war.

G. M. BENNETT,
Commander, R.N.

5th January, 1949.

SIR,—I have read with great interest the correspondence in the November number of the JOURNAL following the admirable statement of the case for and against the battleship, by Commander Bennett, in the August number. It appears to me that two points have been missed, and possibly a third.

As nucleus for the escort of ocean convoys which may expect heavy weather, surely the most economical and effective is the battleship. This seems to me to have been proved by experience, the only alternatives being cruisers, which are insufficiently powerful and are probably not available owing to the limitation of their numbers, or carriers, which might well, in heavy weather, be unable to fly off their aircraft, and at night or in thick weather to distinguish their targets.

The effectiveness of a battleship as the centre-piece of such a minor operation as the seizure of Madagascar or the attack on Narvik, was very lightly passed over by Commander Bennett. The battleship has considerable and varied resources in addition to her gun power. She has accommodation available for the directing staff, a large complement of seamen, marines, and artificers of many descriptions, a workshop, adequate sick berth accommodation, boats, specialist officers, fresh water and stores of every kind. The recent war has demonstrated the necessity to acquire not only major bases, but many smaller bases for light craft, as well as to destroy those in use by the enemy, and it seems highly probable that such minor expeditions as have been referred to may be anticipated in a future war.

Again, in planning the constitution of the force necessary for any measure in war, it is proper, after forecasting as far as possible the probable course of the operations involved,

whether they be large or small, to make a generous allowance for the unforeseen. The battleships of the " Revenge " and " Queen Elizabeth " classes were in service up to the end of the War. The expense of maintaining some of them could have been minimized by their utilization as training ships.

As regards such expense, it must be remembered that although the principal responsibility for the defence of the Home Country rests with the Air Force, and that for the eventual winning of a war mainly with the Army, neither of those Services, nor indeed the Navy itself, can operate unless the sea communications are secure; and priority must therefore be given to the measures necessary to attain that object.

With all deference to those more in touch with modern naval requirements than I can pretend to be, I submit that we should have been wise to retain at least two of the most efficient battleships of the above-mentioned classes, and to maintain them in their existing condition without, at present, further large expenditure on modernization.

SYDNEY R. FREMANTLE,
Admiral.

24th January, 1949.

REGIMENTAL TRANSPORT

SIR,—Referring to the most interesting article written by Lieut.-Colonel Jebens in the November issue of the JOURNAL on the subject of regimental transport, I consider that he omitted three desirable features from his list of requirements. These are as follows:—

(*a*) Speed in and out of action.
(*b*) Good cross-country performance.
(*c*) Economic use of manpower.

The solution of the transport problem advocated by Lieut.-Colonel Jebens envisages the exclusive use of 15-cwt. trucks and trailers. The adoption of such a policy would mitigate against all three features detailed above. The low power available on the 15-cwt would be further aggravated by the addition of a trailer; speed of turn round, manœuvrability and cross-country performance would suffer accordingly.

Economy in the use of man-power is prejudiced initially by the necessity to manufacture two trucks in place of one lorry and subsequently by double maintenance requirements and duplication of drivers.

Lieut.-Colonel Jebens also referred to the standardization aspect, which is indeed a matter of great importance. In considering this, however, it should surely be dealt with on an Army basis as opposed to a regimental one, and is consequently affected by the type of organization adopted by the Army. Military and civilian experience has shown that the greatest economy in men and materials can be achieved by utilizing heavy transport for " bulk " delivery over long distances, and trucks or vans for " detailed " or " local " delivery. We should therefore concentrate on the standardization of one type model for each load capacity range rather than on one type of vehicle only.

Regarding cross-country performance, the next war is likely to see considerably more devastation than the last and movement is likely to be further restricted. Speed across country will be an important factor and we must ensure that our transport meets this requirement. The day has gone when we could accept civilian type transport designed for road work; we must insist on vehicles designed to meet Army needs.

I consider, therefore, that regimental transport can still retain two types of lorry but that such vehicles must be designed for fast cross-country operation and that they should include a maximum number of components interchangeable with other standard Army types.

N. MOLONY,
Lieut.-Colonel.

31*st December*, 1948.

SIR,—Lieut.-Colonel Molony appears to have mistaken my meaning. I do not advocate the employment of 15-cwt. trucks drawing trailers. I consider that they should be replaced by vehicles of the "jeep" type towing 15-cwt. trailers. The handiness and cross-country performance of jeeps have been proved in war.

Provided that every tug that replaces a 3-tonner draws two trailers, no increase of manpower within the unit should be necessary.

In my article I confined myself to the consideration of the transport of fighting units, perhaps my title did not make this clear. Such transport is not required to deliver "bulk" over long distances.

I agree that vehicles designed especially for Army needs are the ideal, but I do not believe that industry will ever be able to supply these on a scale adequate for a major war in addition to its commitments of vehicles for essential civilian requirements. If therefore, we are to avoid the improvization which occurred during both the last great wars, we must be prepared to compromise.

F. JEBENS,
Lieut.-Colonel.

13th January, 1949.

THE OFFICER'S WEAPON

SIR,—I am much gratified by the interest taken in my article "The Officer's Weapon" published in the August number, and would ask permission to answer some of the points raised by correspondents.

In the first place, I have only mentioned specific weapons as being representative of a type. I consider all weapons for the Services should be made in this country, and if they were given a free hand I am certain that British inventors and British gunsmiths could produce arms quite as efficient as anything abroad.

My objections to a full automatic weapon would be weight and ammunition supply. If we assume that a burst of ten rounds will be fired to make a kill, then an officer with 100 rounds will kill ten men at the most. A good shot (every officer should be a good shot) with an accurate carbine should account for, say, thirty men out of fifty rounds fired. There is a limit to the weight an officer can carry.

The pistol-cum-carbine compromise might be excellent, but can there be such a weapon?

I was not aware that the officers of the 20th ever carried bayonets, but it seems that this was a sensible local arrangement and not an order or regulation from the Horse Guards.

An officer must of course be trained when to use his weapon and when not to use it. An officer who cannot discipline himself should not be an officer. Equally, an officer armed with a sub-machine gun would have to be trained to use it in short bursts for single targets, and not to waste ammunition.

My suggestion about shot guns was that these, loaded with either ball or buckshot, might be used against officers, not that officers should use them. In the future officers must expect to be fired on by parachutists, partisans, fifth columnists and light-fingered gentry with any weapon these people can command. The question is with what weapon, or weapons, is the officer going to return fire?

May I protest against the qualification "until he leaves the Service"? We urgently need the tradition and sport of target shooting in this country. An officer should be allowed to buy his own arms and to encourage others to take up target shooting as well as practise it himself as long as he is able. Our standard of marksmanship and neglect of practice with all arms is a national disgrace.

Colonel Blacker's most valuable article on this subject raises two questions: (*a*) would the rocket bullet be accurate, and (*b*) if it penetrated into a body before the propellant was exhausted would it be classed as an explosive bullet, and as such be illegal?

E. H. BAXTER.

3rd January, 1949.

NELSON'S MARRIAGE

SIR,—As the fruits of much research have recently appeared in my biography of Nelson, readers of your review on my Lees-Knowles lectures may wonder how I came to make a colossal blunder in the lecture on Nelson, which is likened to Mr. Dalton's gaffe in the House of Commons.[1]

I know more about Lady Nelson's later years than most people and it was the severe pruning of the first draft that, unfortunately, produced this apparent blunder. At the time it was of no consequence as one of the audience gave me the opportunity of explaining that I, of course, had assumed that Lady Nelson, so long estranged from her husband, would have agreed to a divorce. Incidentally the same " colossal blunder " appears in the Epilogue of my biography, but an intelligent reader, having shortly before read all about Lady Nelson's last years, will I hope understand what was in my mind.

W. M. JAMES,
Admiral.

December, 1948.

[1] Admiral James remarked in his *The Influence of Sea Power on the History of the British People—The Lees-Knowles Lectures for* 1947. " Sir William Hamilton's death had left him (Nelson) free to marry Emma."—EDITOR.

GENERAL SERVICE NOTES

MINISTRY OF DEFENCE

It was announced on 13th January, that Air Marshal Sir William Elliot, K.B.E., C.B., D.F.C., is to succeed Lieut.-General Sir Leslie Hollis, K.B.E., C.B., R.M., in April as Chief Staff Officer to the Minister of Defence and as Deputy Secretary (Military) of the Cabinet.

Defence Manpower

The Ministry of Defence, on 29th November, 1948, published the third of a series of quarterly statements showing the Country's defence manpower. The statement, which covers the period up to 1st October, shows that the total strength of the armed forces on that date was 786,900, compared with 846,400 on 1st July, a reduction of 59,500. In the preceding quarter the reduction had been 84,800.

The total strength is made up as follows : Royal Navy, 140,500 (143,100 on 1st July) ; Army, 419,000 (465,800) ; and R.A.F. 227,400 (237,500). The totals include national service men, the women's auxiliary services, nurses, and V.A.D.s. The distribution of national service men was : Royal Navy, 17,300 ; Army, 231,400 ; and R.A.F., 107,300.

The total number of civilians directly employed on work for the forces was 229,000. Of these, 115,200 were non-industrial employees, including those engaged on production, research and development, and works. The number of industrial employees, excluding those engaged on production, research and development, and works, was 113,800. In addition to the directly employed non-industrial staff, there was an estimated average throughout 1947–48 of 350,000 engaged on production, research and development, and works.

The total number of members of the armed forces and civilians directly employed was 1,015,900, compared with 1,075,600 on 1st July. The total strength of the auxiliary and Territorial forces was 63,300, an increase of 7,800 over that of the previous quarter. This figure is made up as follows : R.N.V.R., 2,700 ; Territorial Army and A.T.S. (T.A.), 55,300 ; R.A.F.V.R., 2,500 ; and R.Aux.A.F., 2,800.

Regular Recruitment

Figures of recruitment to the armed forces during 1947 and 1948, issued by the Ministry of Defence on 26th January, show that there were 95,515 recruits in 1947 and 67,501 in 1948, a decrease of 28,014. The total number of regular engagements in 1947 was 66,258 and of men enlisting under the bounty scheme 29,257. Comparable figures for 1948 were 53,703 and 13,798.

The term " regular engagement " comprises civilians with or without previous service experience and excludes men on regular engagements who extend their period of service. The bounty scheme includes the intake under the special short service engagements of one or two years in the R.A.F., which were instituted in September, 1948. Only other ranks are given.

The total figures for each service were : Royal Navy, 21,759 ; Army, 40,498 ; R.A.F., 33,258 in 1947 ; and Royal Navy, 19,711 ; Army, 34,240 ; R.A.F., 13,550 in 1948.

WESTERN UNION

Brigadier F. C. Curtis, C.B.E., who is the Army Member of the British Delegation to the Military Committee of the Western Union Defence Organization, has been appointed Director for Western Union, War Office.

Correction

Commodore R. M. Dick, C.B.E., D.S.C., was appointed Chief of Staff to the Flag Officer, Western Europe and *not* Chief Staff Officer as recorded in these Notes in the November Journal.

IMPERIAL DEFENCE COLLEGE

The following were selected to attend the 1949 course, which started in January at the Imperial Defence College :

ROYAL NAVY.—Captain A. N. C. Bingley, O B.E., Captain W. G. Brittain, C.B.E., Captain R. F. Elkins, C.B.E., Captain D. H. Hall-Thompson, Captain R. G. Mackay, Captain (E.) F. T. Mason, Captain A. D. Torlesse, D.S.O., Captain R. S. Warne, C.B.E., and Captain R. D. Watson, O.B.E.

ARMY.—Brigadier H. E. C. de Chassiron, Brigadier R. G. S. Hobbs, D.S.O., O.B.E., Lieutenant-Colonel R. H. Hewetson, D.S.O., Brigadier W. R. Cox, D.S.O., Brigadier R. N. H. C. Bray, D.S.O., Brigadier A. W. Brown, D.S.O., M.C., Colonel R. K. Exham, O.B.E., M.C., Lieutenant-Colonel R. B. P. K. Goldsmith, Lieutenant-Colonel K. R. Brazier-Creagh, C.B.E., D.S.O., Brigadier G. S. Thompson, D.S.O., M.B.E.

ROYAL AIR FORCE.—Air Commodore Sir Harry Broadhurst, K.B.E., C.B., D.S.O., D.F.C., A.F.C., Air Commodore the Earl of Bandon, C.B., D.S.O., Air Commodore F. J. Fressanges, C.B., Air Commodore T. G. Pike, C.B., O.B.E., D.F.C., Air Commodore H. D. Spreckley, O.B.E., Air Commodore A. W. B. McDonald, A.F.C., Group Captain G. P. Chamberlain, C.B., O.B.E., Group Captain E. N. Lowe, C.B., C.B.E.

CANADA.—Brigadier W. J. Megill, D.S.O., Air Commodore J. G. Bryans, C.B.E., Group Captain H. H. C. Rutledge, O.B.E., Mr. E. A. Cote.

AUSTRALIA.—Captain H. J. Buchanan, D.S.O., R.A.N., Brigadier L. de L. Barham, C.B.E., Group Captain W. L. Hely, A.F.C., Mr. J. L. Knott.

SOUTHERN RHODESIA.—Brigadier S. Garlake.

NEW ZEALAND.—Mr. D. A. Wraight.

SOUTH AFRICA.—Brigadier P. de Waal.

FOREIGN SERVICE.—Mr. D. W. Kermode, C.M.G., Consul-General ; Mr. D. P. Reilly, O.B.E., Counsellor.

HOME CIVIL SERVICE (Administrators).—Mr. K. Anderson, C.B.E., Assistant Secretary, Treasury ; Mr. A. C. W. Drew, Principal, War Office ; Mr. G. Grant, Assistant Secretary, Labour and N.S. ; Mr. G. W. McMahon, Assistant Secretary, Trade ; Mr. F. W. Mottershead, Assistant Secretary, Admiralty ; Mr. J. B. L. Munro, Assistant Secretary, Supply ; Mr. W. A. Wolverson, Assistant Secretary, Post Office.

HOME CIVIL SERVICE (Scientists).—Mr. C. M. Cawley, O.B.E., senior principal, D.S.I.R., and Mr. H. A. Sargeant, senior principal, War Office.

OFFICERS' UNIFORM ALLOWANCES

New rates of uniform allowances for officers of the three Services were announced by Mr. A. V. Alexander, Minister of Defence, in a written Parliamentary reply on 19th January.

He said that as many articles as possible should be issued from Service stocks, without charge, to save public funds. A cash grant would be given to cover the reasonable cost of the remainder, including those articles which must be tailor-made if the requisite standard of smartness was to be maintained.

The new rates would be brought into effect generally from 3rd November, 1948, but retrospective adjustment would be made for Regular Army and R.A.F. officers to the dates from which the first officers passed out since the War from the Royal Military Academy, Sandhurst, and the R.A.F. College, Cranwell. The case of Regular officers in the Navy raised special problems, and the question of retrospection before 3rd November, 1948, was being considered.

Retrospective effect would not be given in the case of certain officers commissioned for less than two years, including National Service officers, as their rates of allowance would be lower than formerly because they would not in future be required to provide themselves with the full scale of uniform of Regular officers. The new rates did not include the cost of tropical kit.

Among the increases are :—

ROYAL NAVY.—From £60 to £103, free issues £17. ROYAL MARINES.—£60 to £144, free issues £12. W.R.N.S.—£55 to £62, free issues £11.

ARMY.—Regular officers, dismounted : £50 to £90, free issues £5. Kilted : £50 to £112, free issues £5. Mounted : £60 to £147, free issues £3. Household : £50 to £108, free issues £5. Household (with addition for mounted duty) : £60 to £169, free issues £5. A.T.S.—£55 to £76, free issues £4. Q.A.I.M.N.S.—£50 to £93, free issues £1.

R.A.F.—Regular officers : £50 to £83, free issues £9. W.A.A.F.—£55 to £90, free issues £6.

ARMY SHORT SERVICE OFFICERS (commissioned for less than two years) have had their allowances reduced from £50 to £32 or £29, with free issues varying from £2 to £14.

Officers of the Territorial Army, Army Cadet Force, Combined Cadet Force and Supplementary Reserve, have had the grant increased from £7 10s. to £21, and the A.T.S. (T.A.) from £6 10s. to £17.

R.A.F. SHORT SERVICE OFFICERS (commissioned for less than two years) have had their allowances reduced from £50 to £14 with free issues of £14 or £15.

Officers of the Reserve, R.A.F., have had the allowance increased from £7 10s. to £14 ; Reserve, W.A.A.F., from £6 10s. to £20 ; and Air Training Corps from £7 10s. to £14. Free issues are at the rate of £16 for the R.A.F. and £13 for the W.A.A.F.

FRANCE

AMALGAMATION OF MEDICAL SERVICES

As from 1st January, 1949, the Directorates of the French Army and Navy Medical Services were merged into a single Service under the Minister of National Defence.

UNITED STATES

REPORT OF THE SECRETARY OF DEFENCE ON THE ADMINISTRATIVE UNIFICATION OF THE SERVICES

In 1947, by the National Security Act, the United States " unified " their armed forces under the title of National Military Establishment. Details of the new organization were published in this JOURNAL last year.[1]

The first Annual Report of the Secretary of Defence—Mr. Forrestal, has now been published. It is a lengthy document, full of detail.

It remarks that, since the unification, good progress has been made in many directions, e.g., the drawing up of strategic plans, the definition of the roles of the three Services, the co-ordination of production and purchase for their needs, joint training, and the establishment of unified commands oversea. The Report mentions, however, that there are still " great areas " in which the views of the three Services do not coincide.

The Report gives as an example the question of the future of the aircraft carrier. It is regarded by the Navy as the " cutting edge " of modern naval power, but many Air Force officers regard it as obsolete in present conditions. " However," says the Report, " all air forces are prone to regard as obsolete everything which is not used by themselves ; and . . . the belief that air power can replace land power is a public misconception."

[1] See " The United States Armed Services," in the JOURNAL of August, 1948, page 358.

In a summary of the report by the Military Correspondent of *The Times*, published in that paper on 11th January, 1949, it is remarked: "It is . . . roundly claimed in the first sentences of the introduction that the United States has grown stronger during the fifteen months since the National Service Act of 1947 became law. There can be no doubt about this or that the administrative machinery has become increasingly effective. Yet the experienced observer may find matter for doubt beside functional and organizational charts which are so dear to bureaucracy. There is an unending conflict between the ideal of an efficiency which can be attained only by the application of thousands of administrators and technicians to their various tasks and the diminishing returns, overlapping, and ignorance of what goes on next door which act as handicaps when organizations increase in size and complexity beyond a certain point. It may be hazarded that it is in this field that the Secretary of Defence will find his stiffest problems. On the other hand, in present conditions it is impossible to return to small numbers and simplicity. That being granted, it would seem that the United States National Military Establishment is being organized on sound and businesslike lines."

NEW INTERNATIONAL WEATHER CODE

A new International Meteorological Code came into force on 1st January, 1949. This is the code used by the world-wide network in broadcasting weather bulletins for shipping and by ships in supplying weather news.

A key to the new codes has been published by the Air Ministry through the Stationery Office and includes a map of the weather bulletin sea areas around Britain, the complete list of weather bulletins broadcast daily from British coastal radio stations, a specimen Atlantic weather bulletin, and instructions for plotting a weather chart.

The Atlantic weather bulletin is broadcast from Portishead, near Bristol, at 9.30 each morning and evening, and at 11.45 a.m. (G.M.T.). Only part of these bulletins is in plain language, but with the aid of the new decode, amateur as well as professional meteorologists and wireless enthusiasts will be able to collect and decode their own weather information.

NAVY NOTES

GREAT BRITAIN

H.M. The King

It was announced from Buckingham Palace on 23rd November that, on medical advice, His Majesty had agreed to cancel all his public engagements over a period of some months. This necessitated the indefinite postponement of the visit to Australia and New Zealand which the King and Queen had undertaken to pay, with Princess Margaret, during the first half of 1949.

The following have been appointed Naval Aides-de-Camp to the King from 15th November, 1948, in succession to the officers stated, placed on the Retired List :—

Captain (E) G. C. Ross, C.B.E., in place of Captain (E) C. R. O. Burge, D.S.O.
Captain (E) F. V. Stopford, in place of Captain (E) W. D. Brown, D.S.C.

Colonel E. E. Johnson, R.M., has been appointed a Royal Marine Aide-de-Camp to the King, from 1st November, 1948, vice Colonel J. E. Leech-Porter, C.B.E., A.D.C., promoted to Major-General.

The Rev. Owen Roebuck, O.B.E., Senior Chaplain, Church of Scotland and the Free Churches, has been appointed an Honorary Chaplain to the King from 12th October, 1948, in succession to the Rev. Dr. A. Campsie, C.B.E., M.C.

Flag Appointments

Third Sea Lord.—The King has been pleased to approve the appointment of Vice-Admiral M. M. Denny, C.B., C.B.E., D.S.O., to be a Lord Commissioner of the Admiralty, Third Sea Lord and Controller in succession to Vice-Admiral Sir Charles S. Daniel, K.C.B., C.B.E., D.S.O., to take effect in May, 1949.

America and West Indies.—The King has approved the appointment of Rear-Admiral R. V. Symonds-Tayler, C.B., D.S.C., as Commander-in-Chief, America and West Indies, in succession to Admiral Sir William G. Tennant, K.C.B., C.B.E., M.V.O., to date April, 1949.

Mediterranean (Air).—Acting on medical advice, Vice-Admiral Sir Thomas Troubridge, K.C.B., D.S.O., the Flag Officer (Air) and Second-in-Command, Mediterranean Station, struck his flag on 6th November, and returned to the United Kingdom. On 20th November, the appointment was announced of Vice-Admiral C. E. Douglas-Pennant, C.B., C.B.E., D.S.O., D.S.C., to succeed him, to date December, 1948.

Mediterranean (Destroyers).—The appointment was announced on 10th December, of Rear-Admiral H. W. U. McCall, D.S.O., to be Flag Officer (Destroyers), Mediterranean Fleet, in succession to Vice-Admiral M. M. Denny, C.B., C.B.E., D.S.O., to date February, 1949.

Second Cruiser Squadron.—The appointment was announced on 10th December, of Rear-Admiral W. R. Slayter, C.B., D.S.O., D.S.C., to be Flag Officer Commanding Second Cruiser Squadron, in succession to Vice-Admiral the Hon. G. H. E. Russell, C.B., C.B.E., D.S.O., to date May, 1949.

Flag Officer, Ground Training.—The appointment was announced on 9th January, of Rear-Admiral D. H. Everett, C.B.E., D.S.O., as Flag Officer, Ground Training, to date 24th January. Flag Officer, Ground Training, is a new appointment, brought about by a reorganization of the Home Air Command. The Flag Officer will be an additional sub-commander of the Flag Officer, Air (Home), and will take over certain duties at present assigned to the Rear-Admiral(E)-in-Charge, Reserve Aircraft and Technical Training. He will be responsible to the Flag Officer, Air (Home), for supervising the training of ground personnel employed in naval aviation, and will be the administrative authority for air stations and establishments concerned. He will also be responsible

for the administration of the Royal Naval Barracks at Lee-on-Solent, which will remain under the direct command of the Commodore.

DEPUTY ENGINEER-IN-CHIEF.—The appointment was announced on 17th December, of Rear-Admiral (E) W. G. Cowland to be Deputy Engineer-in-Chief of the Fleet on 24th December, 1948, in succession to Rear-Admiral (E) the Hon. D. C. Maxwell, C.B., C.B.E.

ADMIRALTY APPOINTMENTS, MINISTRY OF SUPPLY

Captain (E) W. K. Weston, O.B.E., R.N., has been appointed for duty with the Chief Naval Representative, Ministry of Supply, at the Naval Marine Wing of the National Gas Turbine Establishment, which is to carry out development work on marine gas turbine plants for naval purposes.

Captain C. W. Byas, R.N., has relieved Captain H. L. St. J. Fancourt, D.S.O., R.N., as Director of Naval Aircraft Development and Production and Deputy Chief Naval Representative (Air), Ministry of Supply.

TRINITY HOUSE

Captain Sir Arthur Morrell, K.B.E., the Deputy Master of the Corporation of Trinity House, retired from active service on 1st October, 1948, and Captain Gerald Curteis, M.V.O., R.N.(Retired), has been appointed Deputy Master in his stead.

BLACK ROD

The Lord Chancellor informed the House of Lords on 15th December, that Vice-Admiral Sir Geoffrey Blake, K.C.B., D.S.O., had received permission from the King to retire from the appointment of Gentleman Usher of the Black Rod when Parliament reassembled after the Christmas adjournment. Sir Geoffrey's decision to seek the King's approval of his retirement was necessitated by his deafness, which was the result of gun blast and was becoming progressively worse. The Lord Chancellor added an expression of regret at losing the services of Sir Geoffrey, who had carried out his duties with such marked distinction and so much kindness and consideration to them all.

PROMOTIONS AND RETIREMENTS

HALF-YEARLY LISTS

The following promotions and retirements have been approved, to date 8th January, 1949 :—

TO BE PROMOTED TO REAR-ADMIRAL IN H.M. FLEET :—

Captain E. M. Evans-Lombe, C.B.
Captain D. H. Everett, C.B.E., D.S.O.
Captain C. C. Hughes-Hallett, C.B.E.
Captain R. K. Dickson, D.S.O.
Captain D. M. Lees, D.S.O.
Captain (Commodore 2nd Class) J. A. S. Eccles, C.B.E.

TO BE PLACED ON THE RETIRED LIST IN THE RANK OF CAPTAIN :—

Captain W. H. D. Friedberger, D.S.O.
Captain G. F. Stevens-Guille, D.S.O. and Bar, O.B.E.
Captain M. H. Evelegh.
Captain J. L. Storey, C.B.E., D.S.O.
Captain J. W. Farquhar, D.S.O.
Captain David Gilmour.
Captain E. B. K. Stevens, D.S.O. and Bar, D.S.C.
Captain J. W. Josselyn, D.S.C.

TO BE PROMOTED TO REAR-ADMIRAL (L) :—

Captain (L) S. L. Bateson, C.B.E.

The following promotions have been made to date 31st December, 1948 :—

COMMANDER TO CAPTAIN.—W. L. M. Brown, R. G. Mills, F. R. Main, C. E. Keys (Acting Captain), V. J. H. Van der Byl, J. M. Villiers, D. R. F. Cambell, A. R. Kennedy, R. T. Paul, W. A. F. Hawkins, P. J. Milner-Barry, D. P. Dreyer, A. D. Lenox-Conyngham, J. E. M. Glenny, M. E. Butler-Bowdon, H. P. Sears.

LIEUTENANT-COMMANDER TO COMMANDER.—J. F. B. Brown, D. F. Chilton, D. A. G. Mackworth (Acting Commander), A. R. Cheyne, S. A. G. St. John, G. O. Roberts, C. C. Lowry, H. H. Bracken, H. A. Stuart-Menteth, R. S. Brookes, P. E. Yonge, K. C. Grieve, P. B. N. Lewis, W. F. Skelton, D. G. Clutterbuck, M. E. Lashmore, C. P. Yates, G. J. A. Lumsden, J. C. Stodart, P. F. Manisty, C. E. J. Streatfeild, F. B. P. Brayne-Nicholls, D. G. D. Hall-Wright, N. L. A. Jewell, E. T. Stanley, C. S. Battersby, C. F. Parker, T. W. Best, W. J. Parker, H. R. B. Janvrin, R. D. Ritchie, H. G. Barnard, R. Gatehouse.

LIEUTENANT-COMMANDER (A) TO COMMANDER (A).—A. S. Downes, L. J. Kiggell.

COMMANDER (E) TO CAPTAIN (E).—C. Gatey, G. O. Naish, J. P. W. Furse, C. W. Jones, G. A. M. Wilson.

LIEUTENANT-COMMANDER (E) TO COMMANDER (E).—R. J. Rampling, E. G. J. D. Fulford, J. G. McDonald, T. H. Norman, J. P. Kirkby, O. J. F. L. St. John, G. H. B. N. Hunter, G. W. Dibben, W. B. S. Milln, H. G. Southwood, J. L. Sedgwick, J. G. T. D. Atkinson, P. F. J. Trollope, B. E. M. Ball, L. E. S. H. LeBailly.

COMMANDER (L) TO CAPTAIN (L).—L. S. Bennett.

LIEUTENANT-COMMANDER (L) TO COMMANDER (L).—A. C. Pitman, R. F. Stubbs, J. W. Cortlandt-Simpson, F. A. Booth, R. H. H. Eddey.

INSTRUCTOR COMMANDER TO INSTRUCTOR CAPTAIN.—W. J. Baxter (Acting Instructor Captain).

INSTRUCTOR LIEUTENANT-COMMANDER TO INSTRUCTOR COMMANDER.—J. C. Gascoigne, G. P. Britton, W. H. Watts, L. J. Daw.

SURGEON COMMANDER TO SURGEON CAPTAIN.—D. M. Beaton, J. G. Maguire.

SURGEON COMMANDER (D) TO SURGEON CAPTAIN (D).—L. B. Osborne (Acting Surgeon Captain (D)).

SURGEON LIEUTENANT-COMMANDER (D) TO SURGEON COMMANDER (D).—D. D. Craig, W. L. Mountain, S. R. Wallis (all Acting Surgeon Commanders (D)).

COMMANDER (S) TO CAPTAIN (S).—E. C. Crisp, V. E. Rusby, R. A. Braine, A. T. Phillips, H. P. Koelle.

LIEUTENANT-COMMANDER (S) TO COMMANDER (S).—N. L. C. Spencer, G. I. Palmer, L. G. Underhill, W. L. F. Hughes, N. S. Grant, I. G. Mason, A. D. M. Williams, A. D. Baird, P. F. G. Page, C. E. Smith.

Rear-Admiral (E) T. H. Simpson, M.V.O., placed on Retired List (16th September, 1948).

Rear-Admiral (E) Sir John L. Bedale, K.B.E., C.B., placed on Retired List (25th November, 1948).

Captain (E) W. S. Jameson, C.B.E., promoted to Rear-Admiral (E), (15th November, 1948).

Captain (E) L. A. Taylor, C.B.E., promoted to Rear-Admiral (E), (15th November, 1948).

Captain C. R. O. Burge, D.S.O., A.D.C., placed on Retired List (15th November, 1948).

Captain W. D. Brown, D.S.C., A.D.C., placed on Retired List (15th November, 1948).

Rear-Admiral (Retired) E. G. N. Rushbrooke, C.B.E., D.S.C., is promoted to Vice-Admiral (Retired), (22nd October, 1948).

Rear-Admiral M. H. A. Kelsey, C.B., D.S.C., is placed on the Retired List (15th January, 1949).

Honours and Awards

New Year Honours

The following were among the New Year Honours conferred by the King :—

G.C.B. (Military).—Admiral Sir Harold M. Burrough, K.C.B., K.B.E., D.S.O.

K.C.B. (Military).—Vice-Admiral George E. Creasy, C.B., C.B.E., D.S.O., M.V.O., Vice-Admiral Reginald H. Portal, C.B., D.S.C.

C.B. (Military).—Rear-Admiral S. H. T. Arliss, D.S.O., Rear-Admiral C. Caslon, C.B.E., Rear-Admiral P. K. Enright, C.B.E., Rear-Admiral G. A. B. Hawkins, M.V.O., D.S.C., Rear-Admiral H. W. U. McCall, D.S.O., Surgeon Rear-Admiral L. F. Strugnell, K.H.P., Major-General V. D. Thomas, O.B.E., R.M., Rear-Admiral D. Young-Jamieson.

K.C.V.O.—Commander (S) Ernest Dudley Colles, C.V.O., O.B.E., R.N. (Retired) (Secretary of the Privy Purse and Deputy Treasurer to the King).

K.B.E. (Military).—Engineer Rear-Admiral Sydney O. Frew, C.B., Vice-Admiral Harold R. G. Kinahan, C.B., C.B.E.

C.B.E. (Military).—The Right Rev. Mgr. Edward Dewey, V.G., Chaplain, R.N., Surgeon Captain R. W. Mussen, R.N., Captain (S) H. G. Pertwee, D.S.O., R.N., Captain (E) O. W. Phillips, R.N. (Retired), Rear-Admiral (E) H. S. Roome, Instructor Captain J. C. N. Taylor, R.N.

Exercises and Cruises

Home Fleet Spring Cruise.—The Admiralty announced on 5th January, that the Home Fleet would sail for its Spring cruise from Portland on 31st January, under the command of Admiral Sir Rhoderick McGrigor, with his flag in the battleship " Duke of York." The Fleet was to proceed to Gibraltar, returning to home ports on 24th and 25th March. While at Gibraltar it was hoped that combined exercises would take place with units of the Mediterranean Fleet.

Visit to West Indies.—Ships of the Home Fleet left Bermuda on 28th November, on the conclusion of various visits to ports in the West Indies in the course of their Autumn cruise. The First Lord, Viscount Hall, who had taken passage in H.M.S. " Duke of York " at the end of September, accompanied the Fleet as far as Trinidad, and then flew to Jamaica and Bermuda, arriving home by air on 13th October. The " Duke of York," escorted by the destroyer " St. James," visited Norfolk, Virginia, in November, where Admiral McGrigor transferred his flag to the " St. James " and proceeded up the Potomac River to Washington for visits to United States naval officials.

Carriers in South Africa.—The Third Aircraft Carrier Squadron, Home Fleet, arrived in Table Bay on 18th October, on a visit to South African ports. It included H.M.S. " Theseus," wearing the flag of Rear-Admiral M. J. Mansergh, and H.M.S. " Vengeance," with the destroyers " Agincourt," " Alamein," " Corunna " and " Jutland." Exercises with the South African frigates " Natal " and " Transvaal " were held before the Squadron left Cape Town on 16th November, to return home.

Combined Exercises.—As the Home Fleet approached the United Kingdom early in December on the return from its Autumn cruise, a number of exercises were carried out in conjunction with other naval forces and units of the R.A.F. The carrier " Illustrious " with five destroyers from Gibraltar, joined the Fleet off the Azores, and other destroyer, submarine, and coastal forces took part in the programme, together with

R.N. aircraft and aircraft from the R.A.F. Bomber, Coastal and Fighter Commands. A comprehensive series of exercises included the simulation of the explosion of atomic bombs.

ARCTIC EXERCISE.—The aircraft carrier "Vengeance," with two destroyers, a "Loch" class frigate, a submarine and an oiler, are constituting an experimental force which it was announced in December would sail early in 1949 for a cruise in the North Atlantic and Arctic to study the effects of very cold weather conditions on naval personnel and material. A specially equipped air group, including some jet-propelled aircraft, is to be embarked in the "Vengeance." The effects of very cold weather on the functioning of weapons will be studied, and naval surgeons and psychologists will be concerned with the reactions of the ships' companies. The operations are to last about six weeks.

ANTARCTIC CRUISE.—During December, the sloop "Sparrow" (Commander J. V. Waterhouse, D.S.O., R.N.) made a cruise round British possessions in the Antarctic in company with the Falkland Islands Dependencies surveying ship "John Biscoe," which had arrived from England in the previous month with relief personnel, stores and mail for Antarctic bases. They reached the South Orkneys on 3rd December, the earliest recorded date in the Summer for a visit by ships to those parts. Signey Island, Admiralty Bay (South Shetlands), and Deception Island were visited, and in the strait between Elephant Island and Cornwallis Island, uncharted and unnamed, the vessels ran the first lines of soundings for those waters.

FALKLANDS CRUISE.—It was announced from Bermuda on 4th January, that the Commander-in-Chief, America and West Indies, Admiral Sir William Tennant, had left in his flagship—the cruiser "Glasgow," (Captain C. L. Firth), for a three months cruise to the southern part of his station which would include a visit to the Falkland Islands. The frigate "Bigbury Bay" (Lieutenant-Commander G. R. P. Gooden) and the sloop "Snipe" (Commander C. G. Walker), were in company. It was expected that visits would be paid to certain British dependencies in the vicinity, to the sovereignty of which various alien claims had been made.

H.M.S. "VANGUARD."—On 27th November, the Admiralty announced that H.M.S. "Vanguard," which was originally to have taken the King and Queen on the Royal Tour, was to be ready for sea by 31st January, and would then complete gunnery trials and work up in the Mediterranean, remaining under the orders of the Commander-in-Chief, Mediterranean, until towards the end of July. She will return to Devonport by 1st August, to give Summer and deferred Easter leave.

RESCUE BY H.M.S. "COSSACK."—It was announced from Headquarters of the Far East Station at Singapore on 31st October, that 1,200 Chinese troops from a sinking Chinese transport, the "Yinglung," had been rescued after the vessel had run aground at Masu Bay, West of Keelung, in Formosa. A later message from Shanghai said that Lieutenant-Commander W. Dennis, R.N., swam through rough seas to secure a lifeline, and he and Lieutenant A. Whitehead, R.N., led the two rescue parties from the "Cossack."

PERSONNEL

INCREASED LEAVE.—On 7th December, the Admiralty announced an adjustment of the peace-time leave scale for the Royal Navy. The leave periods which have been in force since the end of the War broadly become the basis of a permanent scale, but certain further concessions are granted. Those serving in home establishments and ships in home ports are to be entitled to an additional four long week-ends a year, bringing their annual leave up to thirty days and twelve long week-ends. Those serving in North-Western Europe, hitherto entitled to 42 days annual leave, will in future receive in addition 21 days disembarkation leave on returning to this country, if they have had their families with them during their foreign service. Formerly they received seven days disembarkation leave. The annual leave period for those serving in sea-going ships in the Home Fleet remains at 42 days (normally 14 days at or about Easter, midsummer and Christmas).

ENTRY OF YOUTHS.—An addition to the recruiting programme was made in October, when entry was opened to youths between 16½ and 17½ years. Formerly recruits were accepted as boys between 15 and 16 and as men from 17½ to 23. For the present, the numbers to be entered under the new scheme will be limited to 1,000. Youths can enter in the new rates of junior stoker, junior writer, junior stores assistant, junior assistant steward, junior assistant cook and junior naval airman. In addition, there is a scheme for entering junior electricians' mates and junior radio electricians' mates at 16½ years. Ratings will be entered on special service engagements for about eight years' service with the Fleet and four in the Royal Fleet Reserve.

NATIONAL SERVICE.—The Parliamentary Secretary to the Admiralty, in a reply in the House of Commons on 15th December, stated that it had been decided that all National Service men in the Royal Navy should have the opportunity to reach officer rank during their period of full-time service. Successful candidates will be required to join the R.N.V.R.

PRIZE MONEY.—The text was published on 30th October, of the bill to provide for the payment of prize money from the sale of captured enemy vessels and cargo during the Second World War, and it has since been discussed in Parliament. On 9th November, a White Paper (Cmd. 7549, price 1d.) was issued containing a "Draft Proclamation" granting prize money and regulations governing the shares of officers and men in the Royal Navy and Royal Marines. The amounts available are £4,000,000 for the Navy and £1,250,000 for the R.A.F. The qualification for participation in the Navy Prize Fund is not less than 180 days' service at sea between September, 1939, and September, 1945. During the discussion on the second reading of the Prize Bill in the House of Lords on 7th December, the First Lord, Viscount Hall, said that shares (tax free) would work out at slightly less than the estimates given in the House of Commons, and would be £4 10s. to £5 for a seaman, £18 to £20 for a Captain, and £45 to £50 for an Admiral.

GREENWICH HOSPITAL SCHOOL.—An Order in Council of 22nd December, published in the *London Gazette* on 24th December, amends the regulations for admission to Greenwich Hospital School, approved by Order in Council of 12th December, 1883. The new order limits admission to the school to sons of British subjects, whether by birth or naturalization, and sons of naval and seafaring men. The King has also sanctioned regulations governing the granting of pensions. Under the new regulations, in case of exceptional financial distress, pensions of 10s. 6d. a week may be granted by the Admiralty out of Hospital funds to the widow of any man who has served as a non-commissioned officer, petty officer or man in the Royal Navy or Royal Marines or any naval reserve force. Awards will be made on a temporary basis, normally for one year, with a review of the pensioner's circumstances at the end of the year.

LOSS OF H.M.S. "ILLUSTRIOUS'" PINNACE.—A pinnace from the aircraft carrier "Illustrious" returning to the ship on the night of 17th October, capsized in rough weather in Portland Harbour, and Midshipman Richard Arthur Clough and 28 ratings were drowned. A memorial fund opened to assist the next-of-kin of victims had raised nearly £4,000 when it was closed on 31st December.

WOMEN'S ROYAL NAVAL SERVICE

SPECIAL ENTRY.—The Admiralty on 11th December, invited applications from suitable women for special entry to officer rank in the W.R.N.S. Candidates must be between the ages of 20½ and 29, of good general education, and desirous of making the Service a career. Special consideration would be given to applicants who could offer good qualifications in secretarial work, accountancy or domestic science, and administrative work of any kind. A few posts for personnel selection, meteorological and education officers would also be available. This opportunity, concluded the announcement, is likely to be for a limited period only, and applications should be made immediately to the Director, W.R.N.S., Queen Anne's Mansions, London, S.W.1.

Naval Memorials

Jellicoe and Beatty.—The Duke of Gloucester, accompanied by the Duchess of Gloucester, unveiled on Trafalgar Day (21st October) the memorial bronze busts, which have been placed on the North side of Trafalgar Square to Admirals of the Fleet Lord Jellicoe and Lord Beatty. A representative parade of about 2,500 included massed bands and bugles of the Royal Marines, contingents of Welsh Guards and State Trumpeters of the Household Cavalry in full dress uniform, an R.A.F. detachment, ex-service men (including about 80 shipmates of Jellicoe and Beatty), and representatives of naval reserve forces, the W.R.N.S., and youth organizations associated with the sea. An ecclesiastical procession included the massed choirs of St. Paul's and Westminster Abbey. After the unveiling, the memorials were dedicated by the Archbishop of Canterbury. (The text of His Royal Highness's Address was published in the Journal for November, 1948.)

H.M.S. "Royal Oak."—A bronze tablet in memory of the 833 officers and men who lost their lives when the battleship "Royal Oak" was sunk in Scapa Flow on 14th October, 1939, was unveiled in St. Magnus Cathedral, Kirkwall, Orkney, on the ninth anniversary of her loss, by Rear-Admiral W. G. Benn, who was Captain of the "Royal Oak" at the time. After the service, conducted by the Rev. G. Arthur Fryer, Minister of St. Magnus, Rear-Admiral Benn dropped a wreath in the waters which cover the ship.

Walcheren.—The landings of the Royal Marines on the island of Walcheren at the beginning of November, 1944, were commemorated on 25th November, in the village of Westkapelle. Princess Wilhelmina (the former Queen of the Netherlands) planted the first tree of a small park which is to be part of the replanting scheme of the village, and another tree was planted by General Sir Dallas Brooks, Commandant-General, Royal Marines.

H.M.S. "Excellent."—On 4th December—St. Barbara's Day, the patron saint of Gunnery, Admiral of the Fleet Lord Chatfield unveiled a memorial in the Gunner. Mates' mess of H.M.S. "Excellent," Whale Island, to their messmates who fell in the Wars

Material

Explosion Tests.—Trials are taking place at Loch Striven on the effect of non-contact under-water explosions on the cruiser "Orion," the destroyer "Ashanti," and on the "Ace"—an "A" class submarine, the building of which was stopped at the end of the War and which therefore represents modern submarine design practice. At Rosyth trials are being conducted with the "Albuera"—a "battle" class destroyer, the completion of which was stopped at the end of the War. The ship is being loaded by flooding compartments while she is afloat. Trials in dock will take place later at Rosyth and will continue up to the point at which the hull structure fails. All these trials form part of the Admiralty ship target programme, begun in 1945, to use surplus warships to amplify experience on ship and weapon design.

Destroyers Scrapped.—In a reply in the House of Commons on 8th December, the Parliamentary Secretary to the Admiralty said that 98 destroyers had been disposed of by the Admiralty since V.J. Day, either by sale or by transfer to foreign Powers. Thirty-nine new destroyers had joined the Fleet during the same period. Constructional work on four aircraft carriers had been suspended, though work on one—the "Majestic," would resume shortly.

Future Submarines.—Speaking at a reunion of submarine officers at Gosport on 17th October, Vice-Admiral Sir Claud Barry, Director of Dockyards and a former submarine officer, said that because of developments in the branch and the submarine's greater potency the present generation of submariners would have a greater part to play. As far as he could see, the future submariners would spend the whole of their time under water. From the time they left home until the time they returned they would be sub-

merged. This, combined with the higher speed of submarines, would make them a more potent weapon than they had ever been before.

ANCHOR TRIALS.—The Admiralty is conducting a series of trials to improve the design of anchors for various classes of ships. Under the supervision of Sir Charles Lillicrap, Director of Naval Construction, trials of certain types took place on the Chesil Beach, near Weymouth, on 23rd November. Tests were made with a new 5½-ton anchor, four times as efficient as older types, and capable of withstanding a pull of more than eight times its own weight. Tests were also made with a 10,000-lb. United States Navy anchor, capable, like the standard Admiralty type, of holding against a pull of four times its own weight; and a 750-lb. anchor of the type used for kedges in the Normandy landings, which can hold against 20 times its own weight.

AWARD TO M.T.B. BUILDERS.—The Royal Commission on Awards to Inventors has recommended that an *ex-gratia* payment of £35,000 be made to Vosper, Limited, of Portsmouth, builders of the M.T.B. 102 prototype. The award is made "in recognition of the enterprise shown in producing on their own initiative before the War not only a design, but a prototype of a motor torpedo-boat which was reproduced in large numbers and proved of great operational value." When the claim was heard by the Commission in September, it was stated on behalf of Vosper, Limited, that they took the risk of building something without any certainty of getting anything back, and that in the early days of the War the Coastal Fleet owed everything to this piece of initiative.

ROYAL NAVAL VOLUNTEER RESERVE

AIR MAINTENANCE.—Training for ex-servicemen with aircraft maintenance experience, airframe and engine trades, has been started in the London Division, R.N.V.R. Midweek lectures and demonstrations take place in H.M.S. "President," headquarters ship, lying off the Victoria Embankment. In addition, volunteers are enabled to do week-end training at the Royal Naval Air Station at Culham, headquarters of the London R.N.V.R. Air Squadron. The course comprises 20 hours of mid-week attendances and eight week-end periods annually. Those wishing to take part in the training should apply to the London Division, R.N.V.R., H.M.S. "President," Blackfriars.

LOWER ENTRY AGE.—The previous age of entry into the R.N.V.R. was above that at which people were called up for national service; it has now been lowered to 17, and men can join before they do their national service. They are then in a position to make certain that their national service is done in the Navy. The initial requirement of the R.N.V.R. is some 1,500 officers and men, and recruitment, which began on 1st November, has been going very well.

LONDON DIVISION WAR MEMORIAL.—It has been decided to raise a Memorial to those of the London Division R.N.V.R. and of the pre-war R.N.V.(S)R. attached to the London Division, who lost their lives in the 1939–45 War. The Memorial will consist of two plaques to be fixed to the Embankment Wall immediately beneath the existing 1914–18 War Memorial. It is also intended to provide a printed Roll of Honour, which will consist of about 360 names, and a further Memorial the exact nature of which will depend upon the response to the appeal. Present and past Members of the London Division, and relatives of the deceased are invited to contribute to the Memorial, and subscriptions should be sent to the Hon. Treasurer, Lieutenant-Commander J. V. Morris, R.N.V.R., H.M.S. "President," King's Reach, London, E.C.4.

ROYAL MARINES

RETIREMENT AND PROMOTION.—Major-General H. T. Newman, C.B., C.B.E., is placed on Retired List, (1st November, 1948). Colonel J. E. Leech-Porter, C.B.E., A.D.C., is promoted to Major-General (1st November, 1948).

HALF-YEARLY PROMOTIONS.—The following promotions have been made to date 31st December, 1948 :—

LIEUTENANT-COLONEL TO COLONEL.—J. C. Westall, R. F. Cornwall.

MAJOR TO LIEUTENANT-COLONEL.—J. C. Cairncross, J. L. Moulton, M. Archdall, H. D. Fellows.

CAPTAIN TO MAJOR.—D. G. Tweed, P. A. Spittall, H. A. Digby-Bell, N. H. D. McGill, J. L. A. Macafee.

APPOINTMENT.—Major-General A. R. Chater, C.B., D.S.O., O.B.E., has been appointed Colonel-Commandant, The Somaliland Scouts, with effect from 8th October, 1948. Recommended by General Wavell for his distinguished services in defending British Somaliland, Major-General Chater, then an acting Brigadier, was awarded the C.B. in 1941.

DOMINIONS AND COLONIES

Closer co-operation between the Colonial Naval Forces is provided for in the Colonial Naval Defence Bill, the text of which was published on 7th December. A Colony already has the power to raise in its own territory a naval force for its own defence, and under the Colonial Naval Defence Act, 1931, it can provide for the service and discipline of such a force outside its own territory. The new Bill, which was introduced in the House of Lords on 6th December, supplements those powers by enabling a Colony to join with other Colonies in raising a naval force for their defence within the territorial waters (including inland waters) of all or any of them.

AUSTRALIA

H.M.A.S. "SYDNEY."—The light aircraft carrier "Terrible," of 14,000 tons, was formally handed over at Devonport on 16th December, to the High Commissioner for Australia—Mr. J. A. Beasley, and was renamed H.M.A.S. "Sydney." The Carrier was handed over by the First Lord, Viscount Hall, who said that with her acquisition and eventually her sister ship, now under construction, and the naval air station at Nowra, the Royal Australian Navy was gaining rapidly in strength.

MANUS BASE.—An advance party of the Royal Australian Air Force arrived early in November at Manus, in the Admiralty Islands, until recently occupied by United States forces, to prepare an Australian-manned base there. The Minister for Air, Mr. Drakeford, announced that a contingent of 50 would prepare the base for the future use of the Navy and Air Force, which would exercise from it periodically.

CANADA

JOINT EXERCISES IN THE PACIFIC.—A squadron consisting of the cruiser "Ontario," the destroyers, "Cayuga," "Athabaskan," and "Crescent," and the sloop "Antigonish" carried out joint exercises with ships of the U.S. Navy in the course of a visit to Pearl Harbour during the latter part of 1948.

The exercises included anti-submarine and anti-aircraft defence and bombardment practice. Arrangements were also made for R.C.N. officers and men to go to sea in U.S. submarine and escort vessels.

NEW A/S VESSEL.—The Minister of National Defence, Mr. Claxton, announced in Ottawa on 28th December, that arrangements are being made by the Defence Department for building in Canada a new type of anti-submarine escort vessel which will have the speed, manœuvrability, and equipment needed to combat the fastest submarines. The vessel will embody modifications of British and United States types, and its construction will be part of a building programme in which there will be a constant process of experimental development of such vessels. A modern ice-breaker is also to be built for service in northern waters, chiefly in supplying Arctic weather stations.

SOUTH AFRICA

SHARE IN DEFENCE.—Vice-Admiral E. D. B. McCarthy—the Commander-in-Chief, South Atlantic, speaking in Cape Town on 13th October, said that the time had come for South Africa to play a greater part in naval defence, with the aim eventually of taking over the naval station at Simonstown. Britain's financial position, he said, was such that she could no longer keep up the same large forces as before. In the course of time, Simonstown should be run entirely by the South African Navy.

INDIA

EX-R.I.N. OFFICERS.—Consequent on the constitutional changes in India, a number of British officers formerly serving in the Royal Indian Navy have been retired from that force, and such officers have no liability for recall for further service with the Royal Indian Navy or the Royal Pakistan Navy, in war or emergency. The Admiralty are of opinion that such officers would form a valuable addition to the Reserves of H.M. Naval Forces and should be invited to join the Emergency List of the Royal Navy, authority for which List was given by Order in Council of 13th May, 1901. Approval for the enrolment of such officers at Admiralty discretion is given by a new Order in Council published in the *London Gazette* on 24th December. This will involve the grant of Commissions in the Royal Navy to those officers who are enrolled on the Emergency List, but the Commissions will not carry any pay, pension or promotion whilst the officers are unemployed.

FOREIGN NAVIES

GREECE

The Italian cruiser " Eugenio di Savoia " is being transferred to Greece under the terms of the Peace Treaty. She displaces nearly 8,000 tons and is armed with eight 6 in. and eight 3.9 in. guns. Her original full speed was over 36 knots.

She will replace the old cruiser " Averof," also of Italian design, and built for the Greek navy in 1910.

RUSSIA

Arrangements have at last been made for the Italian battleship " Giulio Cæsare," the cruiser " Emanuele Filiberto Duca D'Aosta," three destroyers, three torpedo-boats, two submarines and a number of small and auxiliary craft—awarded to Russia under the terms of the Peace Treaty to be transferred to that country.

In conformity with this agreement, the ships lent to Russia by Britain and the United States will now be returned. The former include the old battleship " Royal Sovereign " (renamed by the Russians " Arkhangelsk "), six American-built destroyers (a seventh has been utilized to provide spare parts) and three submarines (ex-U. class). The United States will recover the 7,000 ton cruiser " Milwaukee " (renamed " Murmansk ").

The Soviet navy will still have an extraordinarily large proportion of warships acquired from foreign countries, including Germany, Italy, Rumania, Finland, Estonia, Lithuania, Latvia and Manchuria. Although Russian-built vessels complete a sizeable fleet, it is probable that the more modern ex-German submarines and those now being constructed with German assistance are the only really worth-while units from the point of view of fighting efficiency. It is not possible, however, to say how effectively they are or will be manned.

TURKEY

The situation in the Middle East makes it timely to review the composition of the Turkish Navy. This comprises :—

One battle cruiser.—The "Yaruz" (formerly the German "Goeben"). Although completed in 1911, this ship was refitted and modernized to some extent in 1930 and again in 1938.

She carries ten 11 in., ten 5.9 in., eight 3.5 in. A.A. and a number of smaller guns. She is fairly well armoured and has minute internal sub-divisions.

Eight destroyers.—These are organized in two flotillas; one consists of four ex-Italian vessels of about 1931 vintage, displacing 1,650 tons, carrying four 4.7 in. and four smaller guns, and six 21 in. torpedo tubes; speed (now) about 30 knots.

The second flotilla consists of British-built destroyers of 1,360 tons (one of 1,540 tons), carrying a similar gun armament to the above and eight 21 in. tubes. Their nominal full speed is 34 knots.

Thirteen submarines.—These include four ex-American (1944); three ex-British (1942); one built on German plans; one built in Spain, and four older craft.

Thirty mine-sweepers—small craft of British and American origin.

Also some auxiliary craft, including a sumptuous yacht—the "Savarona" of 5,710 tons.

In the Reserve Fleet are two old cruisers of small fighting value.

UNITED STATES

New Cruisers.—The first of a new class of 17,000 ton cruisers—the "Des Moines" was commissioned for service on 16th November.

These ships have a main armament of nine 8 in. guns, probably mounted in three triple turrets as in the previous "Oregon City" class. The mountings are completely automatic and are reputed to have a rate of fire four times that of any other guns of the same or greater calibre.

The secondary armament consists of twelve 5 in. guns mounted in pairs and thirty 3 in. A.A.

It is believed that these ships, like their predecessors, are designed to carry four aircraft which can be launched by two catapults. They are credited with a maximum speed of 32 knots.

Nine other ships of the class were cancelled.

Reduction of Battleships in Commission.—Since August last, the number of battleships maintained in full commission has been reduced to one—the "Missouri." Revolutionary post-war developments, it is explained officially, have made it necessary to intensify training to fight submarines.

This emphasis on anti-submarine warfare as a future menace was repeated in the programme of cold weather exercises carried out in November last by a large force under Vice-Admiral Donald B. Duncan. In this connection the Navy Department stressed that the development of new techniques to combat the latest types of German submarines —of which the Russians are known to have a considerable number—is a "No. 1 priority with the Navy."

The flagship of this Force was the "Missouri." It is emphasized, however, that the fourteen other battleships now in reserve are being kept "ready for reactivation on short notice."

EXERCISES IN ALASKAN WATERS.—Following on the extensive manœuvres in the North Atlantic last November, further exercises under cold weather conditions were due to be held in February in Alaskan waters.

These will be on a smaller scale, and are designed to test clothing, equipment, and ships' companies. The ships taking part were to include a carrier, a heavy cruiser, a squadron of destroyers and a submarine. Landing craft, attack transports, a cargo ship, and rocket-firing craft would take part in a practice landing.

ROCKET-FIRING SHIP.—The seaplane tender "Norton Sound" has been converted to enable experiments to be carried out from her in firing fourteen-ton rockets. These trials, which will include rockets of the German V-2 and the U.S. Navy's "Aerobee," are designed to further upper atmosphere research.

The seaplane deck of the ship has been sheathed with metal to withstand the heat of firing rockets from their vertical cradle. A helicopter landing platform and a balloon-launching platform have been fitted.

NEW AIRSHIP.—A contract has been placed with the Goodyear Aircraft Corporation of Akron for the construction of the World's largest non-rigid lighter-than-air craft for long-range patrol over open ocean areas and Polar ice fields.

The new airship, to be known as N-1, will have a gas envelope 324 feet long and 71 feet wide, with a helium capacity of 825,000 cubic feet. Underneath this will be a double-deck crew car 87 feet long. The two 800 h.p. Wright Cyclone air-cooled engines are expected to give a speed of over 50 knots.

Up to now the largest non-rigid airship was the M-1, known as "Mighty Mike." This had a helium capacity of 100,000 cubic feet less than N-1; but held the World's record for continuous flight without refuelling for more than a week.

The U.S. Navy had 160 airships operating on anti-submarine patrol in the 1939-45 War. According to official records not one cargo or troop-carrying ship was attacked successfully by an enemy submarine while under airship escort. A similar claim could be made for British airships ("blimps" and "coastals") during the 1914-18 War.

ARMY NOTES

GREAT BRITAIN

H.M. The King

On 8th November, 1948, in Edinburgh, the Princess Royal visited the Army Study Centre in the morning, later attended a luncheon of officers of the Territorial Army, and subsequently visited the 1st Battalion, The Royal Scots at Dreghorn. In the evening the Princess Royal saw a parade of the 13th A.A. (M) Signal Regiment, T.A., at the Drill Hall, Brandon Terrace.

On 29th November, 1948, the Princess Royal, Colonel-in-Chief, presented Colours to the 2nd Battalion, The Royal Scots, at Dreghorn Camp, Edinburgh. A representative party came from Trieste to receive them, and they were supported on parade by the 1st Battalion.

The Princess Royal, Controller Commandant, attended a staff conference of the A.T.S. in London on 8th December, 1948, and inspected units stationed at Catterick Camp on 19th January, 1949.

The Duke of Gloucester, as Colonel of the Regiment, was present at a dinner of the Glasgow branch of the Scots Guards Association which was held in Glasgow on 15th November, 1948.

The Duchess of Gloucester, Colonel-in-Chief, inspected the 1st Battalion, The King's Own Scottish Borderers at Redford Barracks, Edinburgh, on 1st December, 1948.

On 25th November, 1948, the Duchess of Kent, Colonel-in-Chief, The Queen's Own Royal West Kent Regiment, visited the Regimental Depot at Maidstone.

On 28th November, 1948, the Duke of Edinburgh took the salute at a march past of Territorial and Auxiliary Forces in Edinburgh.

The King has approved the following appointments :—

To be Aide-de-Camp General to the King.—General Sir Neil M. Ritchie, K.C.B., K.B.E., D.S.O., M.C. (15th November, 1948).

To be Aides-de-Camp to the King.—Colonel (temporary Brigadier) E. W. C. Hurford, M.B.E., T.D., Royal Artillery (T.A.) (16th September, 1948) ; Lieut.-Colonel (acting Brigadier) Sir George S. Harvie-Watt, Bt., K.C., T.D., M.P., Royal Artillery (T.A.) (22nd November, 1948) ; Brigadier (temporary Major-General) T. J. W. Winterton, C.B., C.B.E. (27th October, 1948) ; Colonel (temporary Brigadier) E. N. Crosse, C.B.E., M.C. (3rd November, 1948).

To be Hon. Dental Surgeon to the King.—Major-General H. J. Higgins, O.B.E., F.D.S., late Royal Army Dental Corps (27th October, 1948).

To be Colonels Commandant.—Of The Somaliland Scouts, Major-General A. R. Chater, C.B., D.S.O., O.B.E., Royal Marines (8th October, 1948) ; of the Royal Signals, Major-General C. H. H. Vulliamy, C.B., D.S.O. (1st January, 1949).

To be Colonels of Regiments.—Of The East Yorkshire Regiment, Brigadier R. J. Springhall, O.B.E. (8th December, 1948) ; of The Devonshire Regiment, Lieut.-Colonel (temporary Colonel) L. H. M. Westropp (1st December, 1948) ; of The York and Lancaster Regiment, Colonel (temporary Brigadier) C. G. Robins (1st January, 1949) ; of The Queen's Own Royal West Kent Regiment, Brigadier W. P. Oliver, C.B., O.B.E. (17th January, 1949).

Colonel-in-Chief.—The King has approved the appointment of Hon. Lieut.-General His Highness Ojaswi Rajanya Maharaja Mohun Shamsher Jang Bahadur Rana, G.C.I.E., G.B.E., Prime Minister and Supreme Commander-in-Chief of Nepal as Colonel-in-Chief, The Brigade of Gurkhas (formerly known as The Gurkha Regiment), 30th April, 1948. (Substituted for the notification in the *London Gazette* dated 11th May, 1948, *vide* Journal for August, 1948, page 486.)

REPRESENTATIVE COLONELS COMMANDANT, 1949.—The following have been appointed Representative Colonels Commandant of their respective Regiments and Corps for the period 1st January to 31st December, 1949 :—

Royal Armoured Corps (*R.T.R. Wing*).—Field-Marshal Viscount Montgomery of Alamein, K.G., G.C.B., D.S.O. (*Cavalry Wing*).—Lieut.-General Sir Charles F. Keightley, K.B.E., C.B., D.S.O.

Royal Tank Regiment.—Major-General Sir Percy C. S. Hobart, K.B.E., C.B., D.S.O., M.C.

Royal Artillery.—Lieut.-General Sir Otto M. Lund, K.C.B., D.S.O.

Royal Engineers.—Lieut.-General Sir Giffard Le Q. Martel, K.C.B., K.B.E., D.S.O., M.C.

Royal Signals.—Colonel (Hon. Major-General) C. W. Fladgate, C.B.E.

Royal Army Service Corps.—Major-General (Hon. Lieut.-General) Sir Humphrey M. Gale, K.B.E., C.B., C.V.O., M.C.

Royal Army Medical Corps.—Lieut.-General Sir William P. MacArthur, K.C.B., D.S.O., O.B.E.

Royal Army Ordnance Corps.—Major-General Sir Leslie H. Williams, K.B.E., C.B., M.C.

Royal Electrical and Mechanical Engineers.—Major-General A. R. Valon, C.B., O.B.E. M.C., M.I.Mech.E.

Royal Army Dental Corps.—Colonel J. P. Duguid.

ARMY COUNCIL

The King has been pleased by Letters Patent under the Great Seal bearing date 1st November, 1948, to appoint the following to be His Majesty's Army Council :—

The Right Hon. E. Shinwell—*President.*
Captain R. M. M. Stewart—*Vice-President.*
General Sir William J. Slim, G.B.E., K.C.B., D.S.O., M.C.
General Sir James S. Steele, K.B.E., C.B., D.S.O., M.C.
General Sir Sidney C. Kirkman, K.B.E., C.B., M.C.
Lieut.-General G. W. R. Templer, C.B., C.M.G., D.S.O., O.B.E.
Lieut.-General Sir Kenneth N. Crawford, K.C.B., M.C.
Sir Eric B. B. Speed, K.C.B., K.B.E., M.C.

HONOURS AND AWARDS

KING'S BIRTHDAY HONOURS LIST.—The following were included in the King's Birthday Honours List published on 1st January, 1949 :—

G.C.B.—General Sir William D. Morgan, K.C.B., D.S.O., M.C.

K.C.B.—Lieut.-General G. H. A. MacMillan, C.B., C.B.E., D.S.O., M.C. ; General Sir James S. Steele, K.B.E., C.B., D.S.O., M.C.

C.B.—Major-General C. N. Bednall, O.B.E., M.C. ; Major-General G. K. Bourne, C.B.E. ; Major-General A. D. Campbell, C.B.E., D.S.O., M.C. ; Major-General (local) A. E. Cottam, C.B.E., M.C. ; Major-General E. E. Down, C.B.E. ; Major-General (temporary) F. Harris, C.B.E., M.C., M.B., K.H.S. ; Major-General G. W. E. Heath, C.B.E., D.S.O., M.C. ; Major-General F. St.D. B. Lejeune, C.B.E. ; Major-General F. R. G. Matthews, D.S.O. ; Major-General E. A. B. Miller, D.S.O., M.C., A.D.C. ; Major-General H. J. Parham, C.B.E., D.S.O., A.D.C. ; Major-General (temporary) A. E. Robinson, D.S.O.

K.B.E.—Lieut.-General G. W. R. Templer, C.B., C.M.G., D.S.O., O.B.E.; Lieut.-General F. G. Wrisberg, C.B., C.B.E.

PALESTINE.—The following awards have been announced in recognition of gallant and distinguished services in Palestine during the period 27th September, 1945, to 26th March, 1946 :—

C.B.—Brigadier (temporary) W. S. Cole, C.B.E., D.S.O., and Brigadier (temporary) J. M. Kirkman, C.B.E.

In recognition of gallant and distinguished services in Palestine during the period 27th March, 1948, to 30th June, 1948 :—

K.B.E.—Major-General H. C. Stockwell, C.B., C.B.E., D.S.O.

APPOINTMENTS

WAR OFFICE.—Major-General E. O. Herbert, C.B., C.B.E., D.S.O., has been appointed Director of Territorial Army and Cadets (January, 1949).

Brigadier F. C. Curtis, C.B.E., who is the Army member of the British delegation to the Military Committee of the Western Union Defence Organization, has been appointed Director for Western Union, War Office.

MINISTRY OF SUPPLY.—Colonel J. L. P. Haines, Deputy Director of Artillery, Ministry of Supply, has been appointed Vice-President, Ordnance Board, Ministry of Supply, with the temporary rank of Major-General (February, 1949).

Brigadier A. P. Lambooy, O.B.E., has been appointed Director-General of Artillery, Ministry of Supply, with the temporary rank of Major-General (December, 1948).

UNITED KINGDOM.—Major-General W. J. Eldridge, C.B., C.B.E., D.S.O., M.C., has been appointed Commandant, Military College of Science (December, 1948).

Major-General W. J. Eldridge, C.B., C.B.E., D.S.O., M.C., has been appointed Commandant, Military College of Science (December, 1948).

Major-General E. M. Bastyan, C.B., C.B.E., has been appointed to the War Office for special duties (January, 1949).

GERMANY.—Major-General G. K. Bourne, C.B.E., has been appointed Commander, British Troops, Berlin (January, 1949).

Major-General J. D. Shapland, C.B., D.S.O., M.C., has been appointed Major-General i/c Administration, B.A.O.R. (December, 1948).

Brigadier G. N. Tuck, O.B.E., has been appointed Chief of Staff, B.A.O.R., with the temporary rank of Major-General (January, 1949).

BURMA.—Brigadier B. Temple, C.B., O.B.E., M.C., A.D.C., has been appointed Head of the British Services Mission to Burma.

EGYPT.—Lieut.-General G. W. E. J. Erskine, C.B., D.S.O., has been appointed General Officer Commanding, British Troops, Egypt and Mediterranean Command.

PROMOTIONS

The following promotions have been announced :—

Field-Marshal.—To be Field-Marshal :—General Sir William J. Slim, G.B.E., K.C.B., D.S.O., M.C. (4th January, 1949).

General.—The following Lieut.-General to be General :—Sir Evelyn H. Barker, K.B.E., C.B., D.S.O., M.C. (15th November, 1948, with seniority 3rd October, 1946).

Lieut.-Generals.—The following Major-Generals to be Lieut.-Generals :—Sir E. C. Robert Mansergh, K.B.E., C.B., M.C. (15th November, 1948); G. W. E. J. Erskine, C.B., D.S.O. (20th December, 1948, with seniority 3rd August, 1946).

Major-Generals.—The following Brigadiers or Colonels (temporary Major-Generals) to be Major-Generals :—E. A. B. Miller, D.S.O., M.C., A.D.C. (27th October, 1948, with seniority 8th January, 1944) ; M. N. Dewing, C.B.E., D.S.O., M.C. (15th November, 1948, with seniority 8th December, 1946) ; H. M. Whitty, C.B., O.B.E. (18th November, 1948, with seniority 12th July, 1944) ; F. Harris, C.B.E., M.C., M.B., K.H.S. (12th December, 1948).

The following to be temporary Major-Generals :—Major (War Subs. Lieut.-Colonel) R. F. K. Belchem, C.B., C.B.E., D.S.O. (9th October, 1948) ; Colonel (temporary Brigadier) L. Wansbrough-Jones, C.B., C.B.E. (19th October, 1948) ; Lieut.-Colonel (temporary Brigadier) G. W. Lathbury, D.S.O., M.B.E. (15th December, 1948) ; Colonel (temporary Brigadier) R. B. B. B. Cooke, C.B.E., D.S.O. (20th December, 1948) ; Colonel (temporary Brigadier) C. F. C. Coleman, D.S.O., O.B.E. (22nd December, 1948).

Retirements

The following General Officers have retired :—Major-General O. de T. Lovett, C.B.E., D.S.O. (18th October, 1948) ; Major-General C. B. Wainwright, C.B. (27th October, 1948) ; Major-General A. B. Austin, C.B., F.D.S., K.H.D.S. (27th October, 1948) ; Major-General R. Richardson, C.B., M.C. (25th October, 1948) ; Major-General T. W. Rees, C.B., C.I.E., D.S.O., M.C. (19th July, 1948) ; General Sir Edwin L. Morris, K.C.B., O.B.E., M.C., A.D.C. (15th November, 1948) ; Major-General W. A. Collings, C.B., C.B.E. (18th November, 1948) ; Major-General E. N. Goddard, C.B., C.I.E., C.B.E., M.V.O., M.C. (29th November, 1948) ; Lieut.-General N. M. S. Irwin, C.B., D.S.O., M.C. (20th December, 1948) ; Major-General L. H. Cox, C.B., C.B.E., M.C. (25th December, 1948) ; Major-General Sir H. Reginald Kerr, K.B.E., C.B., M.C. (8th January, 1949) ; Major-General E. T. L. Gurdon, C.B., C.B.E., M.C. (12th January, 1949) ; Lieut.-General Sir Brian G. Horrocks, K.B.E., C.B., D.S.O., M.C. (13th January, 1949).

The following General Officers have retired, but continue to be borne on the Special List (ex-Indian Army) while employed with the Pakistan Armed Forces :—Major-General Sir Douglas D. Gracey, K.C.I.E., C.B., C.B.E., M.C. (4th June, 1948) ; Major-General S. Greeves, C.B., C.B.E., D.S.O., M.C. (1st September, 1948).

Territorial Army

Recruiting.—The strength of the Territorial Army on 31st December, 1948, was 67,210, compared with its target of 150,000 by March, 1949.

Bands.—The Army Council has given approval to the formation in the Territorial Army of a military or brass band for each Royal Armoured Corps Regiment and each Infantry, Parachute and Special Air Service Battalion. In addition, approval has been given for the formation of ten Royal Artillery bands to be organized on a station basis.

The formation of R.A.C., Infantry, Parachute and Special Air Service bands will be left to the discretion of T.A. Associations and Officers Commanding units. The establishment will consist of one Warrant Officer (Class I), Bandmaster and 30 bandsmen, including a number of non-commissioned officers. These authorized bands do not, of course, include Pipe and Drum and Fife bands which are formed by some units within their normal establishment.

Territorial Army bandsmen will be required to undergo the same obligatory training each year as for other T.A. soldiers, but the proficiency standards required will be modified in the case of men within the higher age limit which in order to attract bandsmen to the T.A. may be raised to 56 years. The continuance in the Service and subsequent re-engagement of bandsmen over the age of 60 will be subject to War Office approval. All instruments and accessories will be provided regimentally by arrangement with the T.A. Associations.

An initial grant of £300 and an annual maintenance grant of £150 will be made to T.A. Associations in respect of each authorized band towards the provision and maintenance

of instruments and accessories and other band expenses. The initial grant of £300 may be claimed immediately on the formation of the band. The maintenance grant of £150 will be payable after the first year.

The scheme does not preclude the formation of unofficial bands on a voluntary basis.

Women's Royal Army Corps

A Royal Warrant has been issued constituting the Women's Royal Army Corps as from 1st February, 1949. A.T.S. units will then be converted into W.R.A.C. units, and acceptance of officers and other ranks into the new Corps will begin.

The W.R.A.C. will be a Corps in the Regular Army, the officers and other ranks of which will, with minor exceptions and modifications, be subject to the Army Act and King's Regulations to the same extent as members of any other Corps of the Army.

Women officers will be granted Commissions in the Land Forces, and women other ranks will be enlisted in accordance with the normal procedure for commissioning of officers and enlistment of soldiers into the Regular Army.

No serving officers or other ranks of the A.T.S. will be compelled to join the new Corps, and any individuals serving at the date of formation who do not wish to serve under the new terms or who are not acceptable for any reason, will continue to serve on their existing conditions for the remainder of their current engagements.

The Royal Warrant authorizing the formation of the W.R.A.C. also covers the raising of Territorial and Reserve components of the Corps.

Conditions of Service.—The age limits for non-serving applicants to join the W.R.A.C. are 18 to 30, but exceptions may be made in the case of ex-Service women. In the case of serving members there is no upper age limit except in the case of Warrant Officers Class 1.

Married women may be accepted provided they understand that they will be required to be available for general service.

Auxiliaries serving on duration of emergency engagements in the A.T.S. and non-serving applicants will be required to enlist on an initial engagement of four years with the Colours. Auxiliaries serving on other engagements will be permitted to modify them. After this, they can extend their colour service for a further four years and a quota of women will be permitted to extend their service to complete twelve years. Members of the W.R.A.C. may complete twenty-two years' service and qualify for a pension.

Release on Marriage.—Women who were married before enlistment and whose family circumstances subsequently changed may apply for discharge on compassionate grounds. Women who marry after enlistment will be entitled to claim discharge, either on marriage or within two months after the date of marriage. Should they not claim discharge at the time of marriage they may apply for discharge on compassionate grounds at a later date if their family circumstances change.

Overseas Service.—Enlistment will be for general service at home and overseas. Women will not normally be posted overseas under the age of 19, or with less than six months' service. Volunteers for overseas service will be given first consideration, but compulsory posting abroad will be carried out if no suitable volunteers are available.

Officers.—Serving officers may apply for Regular Commissions in the W.R.A.C. as can also former officers of the Women's Services now released, ex-other ranks, and direct entry candidates from civil life without previous experience. Women in the latter category may obtain full particulars of the scheme by writing to the Under-Secretary of State, War Office, A.G.16(O), Whitehall, London, S.W.1, or any W.R.A.C. Recruiting Office. Selection is made at a Regular Commissions Board which takes three days, during which the candidates undergo intelligence tests, are interviewed, etc., and observing officers are able to build up a picture of their qualities.

A limited number of Short Service Commissions will also be available to candidates qualified in specialist employment, such as catering, physical training, education, and personnel selection.

Details of pay, pensions and gratuities were published in the White Paper on pay, etc., for the Women's Services issued on 15th December, 1948.

British-Indian Army Memorial

The following letter was published in *The Times* of 4th December, 1948 :—

Sir,—A short while ago a request was made that those who had objects of historical interest connected with the history of the late British-Indian Army, which they were willing to lend or present to a British-Indian Army memorial room to be created at the Royal Military Academy at Sandhurst, should get into touch with the Commandant of the Academy. The response to this appeal was immediate and gratifying.

We now venture to make yet another appeal to the generosity and appreciation of the British people. To equip this memorial room so as to make it worthy of its purpose, it has been estimated that £1,000 will be needed. Once this capital expenditure has been made, it is hoped that no further appeals on account of running expenses will be necessary, as the room will be used as one of the general amenities of the college.

We have yet another appeal to make in connection with the proposed memorial in the Academy chapel to those officers who fell in the last war. The sum required for that part of the memorial scheme commemorating officers of the British Army has already been subscribed, but some £1,500 only of the total of £4,500 required for the memorial to commemorate the officers of the Indian Army, which it is proposed should take the form of a new organ and organ screen on which the crests of all corps and units of the old British-Indian Army shall be carved, has so far been forthcoming. This sum has been given by officers and units of the old Indian Army, but with the break up of this Army consequent on the partition of India last year, the flow of subscriptions has practically ceased.

A sum of £3,000, therefore, is still needed for this worthy purpose. We trust that it is not too much to hope that those who remember the part played by the old Indian Army during the past 150 years, and especially in the two great wars for the survival of the British Commonwealth, will feel disposed to contribute towards its fulfilment. Donations for both purposes may be sent to the Honorary Secretary, War Memorial Appeal, Royal Military Academy, Sandhurst, Camberley.

Yours faithfully,

Birdwood, F.M.

C. J. Auchinleck, F.M.

Miscellaneous

Combined Cadet Force.—A conference was held at the War Office on 27th October, 1948, between representative contingent commanders of the Combined Cadet Force and the Director of the Territorial Army and Cadets (Major-General G. W. E. J. Erskine) and the Director of Military Training (Major-General G. C. Evans). Some fifty schools were represented. It was the first time such a meeting had taken place. A full and frank exchange of views covered all matters interesting the Combined Cadet Force, especially the Army career of the former Cadets, the selection of officers and related problems. The Vice-Chief of the General Staff (Lieut.-General Gerald Templer) addressed the conference.

7th Gurkhas.—Of the Brigade of Gurkhas, the 7th Gurkhas have been converted into Artillery. The 1/7th at Singapore and the 2/7th at Kuala Lumpur were last November

presented by Major-General S. B. Rawlins, Director of Artillery, War Office, with Royal Artillery standards.

TREGARON TRAINING AREA.—The War Office announced last November that owing to a recent change of policy concerning training of the Corps of Royal Engineers, it has been decided, as an experiment, to decentralize the training of Regular and Territorial units of the Royal Engineers within the United Kingdom to Home Commands. In consequence it has been decided not to proceed further under present circumstances with the proposal to acquire a special training area for Royal Engineer units in the vicinity of Tregaron in Wales.

YOUNG SOLDIERS IN GERMANY.—The Archbishop of Canterbury, Dr. Fisher, on his return on 2nd December, 1948, from a 12-day tour of the British zone of Germany, told a Press conference at Lambeth Palace that it was his honest opinion that a great number of young soldiers now in the British zone were getting a far better training for life than they would have done had they stayed in Britain.

"Whatever may have been true a little time ago," he said, "my strong impression was that our young soldiers in Germany are being extremely well looked after and they are doing very well.

"Their officers are handling them with great care and imagination, in the way that the best kind of schoolmaster at a boarding school would deal with his boys. They are working pretty hard and their work is intelligent and interesting. They have facilities for games and exercise and they are being well catered for by the welfare organizations.

"This impression I gained was borne out by the chaplains to whom I spoke and it was confirmed by all the young soldiers with whom I talked. I am very well aware of the fears about the moral welfare of our troops in Germany which have been felt here, but my visit dispelled these fears for me. My own feeling was that there is less likelihood of a young man going off the rails in Germany than if he were in Britain."

ARMY NURSING SERVICES.—With effect from 1st February, 1949, the Queen Alexandra's Imperial Military Nursing Service changed its title to that of Queen Alexandra's Royal Army Nursing Corps.

TOUR OF D.C.I.G.S.—Lieut.-General Sir Kenneth Crawford, Deputy Chief of the Imperial General Staff, landed in England on 19th December, after a two months tour of British garrisons, during which he visited Greece, Egypt, Singapore, Malaya, Australia, America and Canada.

He said there was a big building programme to tackle before all troops were accommodated under proper conditions, but the authorities could not go ahead as fast as they would like for financial and other reasons. Although many of the troops were living under uncomfortable conditions he found them contented; that was especially true of the Guards in Malaya.

SANDHURST.—At the Sovereign's Parade at Sandhurst on 21st December, 1948, the sword of honour presented to the most outstanding officer cadet and the King's medal presented to the officer cadet passing out first in order of merit were won by the same officer cadet. The winner was Senior Under-officer R. N. H. Vickers, son of Lieut.-General W. G. H. Vickers.

ARMY RESERVES OF OFFICERS

The War Office announce that the lists of the Army Reserves of Officers are now being revised, and that officers and ex-officers of the following classes are invited to join either the Regular Army Reserve of Officers or the Army Officers Emergency Reserve :—

(*a*) Regular ex-officers who resigned with less than ten years service.
(*b*) Released Emergency Commissioned officers.

(*c*) Ex-officers who have relinquished short service Commissions since the end of the War, and

(*d*) Retired and released officers formerly of the Indian Army, whether they held Regular or Emergency Commissions.

Officers with the time to spare should join the T.A. but those who cannot do so are urged to apply to join one of the Reserves. Particulars from all Territorial and Auxiliary Forces Associations, Army Recruiting Offices, Regimental Depots or the War Office, S.W.1. Officers overseas should apply to nearest Command G.H.Q. or to the War Office.

Separate arrangements have been made for released Officers of the Supplementary Reserve and Territorial Army, and also released Women Officers.

DOMINIONS

CANADA

GIFT TO THE QUEEN.—Field-Marshal Earl Wavell, Colonel of the Black Watch, was received at Buckingham Palace on 21st December, 1948, by the Queen, who is Colonel-in-Chief of the Regiment. Lord Wavell presented to Her Majesty a silver cigarette-box on behalf of the officers and men of The Black Watch of Canada, of which regiment the Queen is also Colonel-in-Chief.

DEFENCE COLLEGE.—Lieut.-General G. G. Simonds, who is now serving as an Army instructor at the Imperial Defence College in England, is returning to Canada in August to take command of the National Defence College and the Canadian Army Staff College at Kingston, Ontario. Major-General J. F. M. Whiteley, the present commandant of the two Canadian colleges, will return to England soon after General Simonds's arrival in Canada. The return of the two officers to their respective countries will mark the end of a two-year exchange between the British and Canadian Services.

NEW ZEALAND

HONOURS AND AWARDS

GEORGE CROSS.—The King has approved the award of the George Cross to Lance-Corporal D. Russell (deceased), 2nd New Zealand Expeditionary Force, in recognition of gallant and distinguished services whilst a prisoner of war in German hands (prior to September, 1945).

INDIA

DECORATIONS.—Three new awards for gallantry have been decided upon :—

(*a*) The Param Vir Chakra, which will correspond to the British Victoria Cross.

(*b*) The Maha Vir Chakra, which will be the equivalent of the Distinguished Service Order.

(*c*) The Vir Chakra, which will correspond to the Military Cross.

These medals will be awarded to all three Services.

COMMANDER-IN-CHIEF.—Lieut.-General K. M. Cariappa has been selected to succeed General Sir Roy Bucher as Commander-in-Chief, India, with effect from 15th January, 1948. General Cariappa is aged 49.

BRITISH OFFICERS.—On 3rd December, 1948, it was announced that nearly 100 British officers of the 260 then serving with the Indian Army would leave in January, 1949.

PAKISTAN

MILITARY ACADEMY.—On 25th November, 1948, the Governor-General of Pakistan formally opened the Pakistan military academy at Kakul, near Abbottabad.

AIR NOTES

GREAT BRITAIN

Appointments

The following were published in the *London Gazette* on 16th November :—

Air Marshal Sir R. Victor Goddard, K.C.B., C.B.E., to be Air Member for Technical Services on the Air Council, vice Air Chief Marshal Sir Roderic M. Hill, K.C.B., M.C., A.F.C., to date 16th August, 1948.

Air Marshal Sir George Pirie, K.B.E., C.B., M.C., D.F.C., to be Air Member for Supply and Organization on the Air Council, vice Air Marshal Sir Leslie N. Hollinghurst, K.C.B., K.B.E., D.F.C., to date 1st September, 1948.

Air Marshal Sir Arthur P. M. Sanders, K.B.E., C.B., to be an Additional Member of the Air Council on appointment as Vice-Chief of the Air Staff, vice Air Chief Marshal Sir James M. Robb, K.B.E., C.B., D.S.O., D.F.C., A.F.C., to date 1st November, 1948.

The following were announced on 7th November :—

Air Vice-Marshal T. C. Traill, C.B., O.B.E., D.F.C., to be Air Officer in Charge of Administration, R.A.F. Maintenance Command, with effect from 1st December.

Air Commodore G. Harcourt-Smith, C.B., C.B.E., M.V.O., to be Air Officer Commanding, No. 12 Group, Fighter Command, with the acting rank of Air Vice-Marshal, with effect from 17th November.

The following was announced on 3rd December :—

Air Vice-Marshal F. J. Murphy, C.B.E., K.H.S., to be Principal Medical Officer, R.A.F. Mediterranean and Middle East Command.

The following was announced on 5th December :—

Air Vice-Marshal C. E. N. Guest, C.B., C.B.E., to be Assistant Chief of the Air Staff (Operations), Air Ministry, with effect from 6th December, 1948.

The following were announced on 30th December :—

Air Vice-Marshal J. D. I. Hardman, C.B., O.B.E., D.F.C., to be Commandant of the R.A.F. Staff College, Bracknell, with effect from 1st January.

Air Commodore Allan Hesketh, C.B., C.B.E., D.F.C., to be Air Officer Commanding, No. 3 Group, Bomber Command, with the acting rank of Air Vice-Marshal.

Air Commodore (Acting Air Vice-Marshal) Duncan McLaren, C.B.E., K.H.S., to be Principal Medical Officer, Technical Training Command, retaining his acting rank.

The following were announced on 7th January :—

Air Vice-Marshal Edward Barker Addison, C.B., C.B.E., to be Director-General of Signals, Air Ministry, with effect from 3rd March, 1949.

Air Commodore Raymond G. Hart, C.B., C.B.E., M.C., to be Air Officer Commanding No. 90 Group, with the acting rank of Air Vice-Marshal, with effect from 15th February, 1949.

The following was announced on 13th January :—

Air Vice-Marshal Sir Basil Embry, K.B.E., C.B., D.S.O., D.F.C., A.F.C., to be Air Officer Commanding-in-Chief, Fighter Command, in place of Air Marshal Sir William Elliot, K.B.E., C.B., D.F.C., who becomes Chief Staff Officer to the Minister of Defence and Deputy Secretary (Military) of the Cabinet on 19th April.

The following were announced on 16th January :—

Air Vice-Marshal Lawrence Darvall, C.B., M.C., to be Air Officer in Charge of Administration, Flying Training Command, with effect from 14th January.

Air Vice-Marshal G. H. Mills, C.B., D.F.C., to be Air Officer Commanding, No. 1 Group, Bomber Command, with effect from 24th January.

The following was announced on 23rd January :—

Air Commodore A. C. H. Sharp, D.S.O., A.F.C., to be Air Officer Commanding, No. 38 Group, Transport Command, with the acting rank of Air Vice-Marshal, with effect from 17th January.

The following appointments of Air Commodores were announced at various dates :—

Air Commodore G. H. Flinn, C.B.E., to be Air Officer in Charge of Administration at No. 205 Group, R.A.F. Mediterranean and Middle East Command.

Air Commodore H. A. Constantine, C.B., C.B.E., D.S.O., to be Senior Air Staff Officer at No. 205 Group, R.A.F. Mediterranean and Middle East Command.

Air Commodore F. E. Vernon, C.B., O.B.E., to be Senior Technical Staff Officer, British Air Forces of Occupation, Germany.

Group Captain C. J. Luce, D.S.O., to be Command Defence Officer, British Air Forces of Occupation, Germany, with the acting rank of Air Commodore.

Air Commodore H. E. Forrow, C.B., O.B.E., to be Commanding Officer of the R.A.F. Station, St. Athan, Glamorganshire (15th November).

Group Captain J. D. Baker-Carr, A.F.C., to be Director of Armament Research Development (Air), Ministry of Supply, with the acting rank of Air Commodore.

Group Captain C. M. Heard, C.B.E., to be Director of Weapons, Air Ministry (2nd December), with the acting rank of Air Commodore.

Air Commodore A. D. Gillmore, C.B.E., to be Air Officer Commanding No. 64 (Northern Reserve) Group, R.A.F., Heslington, Yorkshire.

Air Commodore B. V. Reynolds, C.B.E., to be Air Officer Commanding, R.A.F., Northern Ireland.

Air Commodore T. N. McEvoy, C.B.E., to be Air Officer Commanding, No. 61 (Eastern Reserve) Group, Kenley, Surrey.

Air Commodore J. G. W. Weston, C.B., O.B.E., to be Director of Policy (Air Staff), Air Ministry (1st January).

Air Commodore A. J. Rankin, O.B.E., A.F.C., to be Director of Intelligence (Operations), Air Ministry.

Air Commodore A. Briscoe to be Principal Medical Officer, R.A.F. Maintenance Command.

Air Commodore F. W. Long, C.B., to be Director of Operations, Air Ministry.

Brigadier M. A. James, V.C., D.S.O., M.C., to be Director of Ground Defence, Air Ministry, vice Air Commodore Long.

Air Commodore F. R. Banks, C.B., C.B.E., has accepted the invitation of the Minister of Civil Aviation to join the Air Safety Board.

Air Commodore S. N. Webster, C.B.E., A.F.C., to be Commanding Officer, R.A.F. Central Photographic Establishment, Benson, Oxfordshire.

Group Captain L. W. Cannon, C.B.E., Assistant Commandant of the R.A.F. Staff College, Andover, since January, 1948, has been appointed Commandant of the College, with the acting rank of Air Commodore.

Air Commodore E. H. Richardson, C.B.E., Director of Signals, Air Ministry, since 1st January, 1948, has been appointed Air Officer Commanding No. 27 (Training) Group, Technical Training Command (17th January).

Air Commodore J. G. Hawtrey, C.B.E., after two years as Director of Operations (Intelligence), Air Ministry, has been appointed Air Officer in Charge of Administration, Coastal Command.

Group Captain E. D. Nicholas, Deputy Director of Radio, Air Ministry, has been appointed Director of Signals, Air Ministry, with the acting rank of Air Commodore.

Air Commodore G. R. Beamish, Director of Weapons, Air Ministry, since August, 1947, has succeeded Air Commodore R. L. R. Atcherley as Air Officer Commanding, R.A.F. Cranwell, and Commandant of the R.A.F. College.

Air Commodore W. A. Opie, late Commanding Officer, R.A.F. Station, St. Athan, Glamorganshire, has been appointed Senior Technical Staff Officer, Headquarters, Air Command, Far East.

Promotions

Half-Yearly List

The following were among the half-yearly promotions made with effect from 1st January, 1949 :—

General Duties Branch

Air Vice-Marshal to Air Marshal—

J. W. Baker, C.B., M.C., D.F.C. (Acting Air Marshal).
Sir Hugh S. P. Walmsley, K.C.I.E., C.B., C.B.E., M.C., D.F.C. (Acting Air Marshal).

Air Commodore to Air Vice-Marshal—

F. J. W. Mellersh, C.B.E., A.F.C. (Acting Air Vice-Marshal).
T. C. Traill, C.B., O.B.E., D.F.C. (Acting Air Vice-Marshal).
G. Harcourt-Smith, C.B., C.B.E., M.V.O. (Acting Air Vice-Marshal).
G. H. Mills, C.B., D.F.C.
A. Hesketh, C.B., C.B.E., D.F.C. (Acting Air Vice-Marshal).
W. A. D. Brook, C.B.E.

Group Captain to Air Commodore—

R. N. Waite, C.B.E.
F. R. D. Swain, C.B.E., A.F.C.
R. Coats.
A. W. B. Macdonald, A.F.C.
H. I. Cozens, C.B., A.F.C.

Technical Branch

Air Commodore to Air Vice-Marshal—

H. J. Roach, C.B., C.B.E., A.F.C. (Acting Air Vice-Marshal).

Group Captain to Air Commodore

L. de V. Chisman, D.F.C.
R. J. Rodwell, C.B.
F. G. S. Mitchell, O.B.E.
V. G. A. Hatcher, O.B.E., A.F.C.
C. A. Bell.

Equipment Branch

Group Captain to Air Commodore—

G. L. Worthington, C.B.E.

Medical Branch

Group Captain to Air Commodore—

E. C. K. H. Foreman, C.B.E.
J. MacC. Kilpatrick, O.B.E.

Grant of Acting Rank—

Air Vice-Marshal T. M. Williams, C.B., O.B.E., M.C., D.F.C., is granted the acting rank of Air Marshal (30th October, 1948).

Air Commodore H. G. White, C.B.E. (Technical Branch), is granted the acting rank of Air Vice-Marshal (1st November, 1948).

Retirements

Air Chief Marshal Sir A. Guy Garrod, G.B.E., K.C.B., M.C., D.F.C., LL.D. (9th October, 1948).

Air Vice-Marshal Sir Matthew B. Frew, K.B.E., C.B., D.S.O., M.C., A.F.C. (at own request) (19th December, 1948).

Group Captain C. Hallawell, retaining the rank of Air Commodore (15th October, 1948).

Technical Branch.—Group Captain L. M. Iles, C.B.E., A.F.C. (at own request), retaining the rank of Air Vice-Marshal (4th November, 1948).

Medical Branch.—Air Vice-Marshal T. McClurkin (at own request) (1st September, 1948).

Group Captain J. D. Leahy, M.C. (at own request), retaining the rank of Air Commodore (26th October, 1948).

Honours and Awards

New Year Honours

The following were included in the New Year Honours conferred by the King :—

K.C.B. (Military).—Acting Air Marshal John W. Baker, C.B., M.C., D.F.C., Acting Air Marshal Aubrey B. Ellwood, C.B., D.S.C., Acting Air Marshal John W. Jones, C.B., C.B.E.

C.B. (Military).—The Rev. J. A. Jagoe, C.B.E., K.H.C., Acting Air Vice-Marshal P. H. Mackworth, C.B.E., D.F.C., Air Commodore E. D. Barnes, A.F.C., Air Commodore C. N. H. Bilney, C.B.E., Air Commodore G. E. Nicholetts, A.F.C., Air Commodore A. H. Robson, O.B.E., M.C., Air Commodore H. V. Satterly, C.B.E., D.F.C., Acting Air Commodore A. W. B. McDonald, A.F.C.

D.B.E. (Military).—Matron-in-Chief Miss Gladys Taylor, C.B.E., R.R.C., Princess Mary's R.A.F. Nursing Service (Retired).

K.B.E. (Military).—Air Vice-Marshal John Whitford, C.B., C.B.E.

C.B.E. (Military).—Air Commodore E. S. Burns, Air Commodore B. E. Essex, Air Commodore J. G. Franks, Group Captain P. E. Berryman, Group Captain W. G. Cheshire, Group Captain J. Mutch, Group Captain E. G. Northway, O.B.E., Group Captain V. H. B. Roth, Group Captain B. C. Yarde, Acting Group Captain J. C. Sisson, D.F.C.

Palestine.—In the *London Gazette* on 29th October, the following was among awards made for distinguished services in Palestine :—

D.S.O.—Air Vice-Marshal Walter Lloyd Dawson, C.B., C.B.E.

Berlin.—In the *London Gazette* on 10th December, the Air Force Cross was awarded to ten officers and the Air Force Medal to ten other ranks of the R.A.F. and R.A.F.V.R. in recognition of their services in the Berlin air lift. Many of them had completed more than a hundred sorties in this operation.

Atlantic.—In the *London Gazette* on 1st January, the first crossing of the Atlantic by jet aircraft, made by Vampires of No. 54 Squadron in July, 1948, was recognized by the award of four Air Force Crosses, one Air Force Medal, and one British Empire Medal. Six commendations were also made for valuable service.

Personnel

National Service Openings.—Mr. Arthur Henderson, Secretary of State for Air, said in London on 25th November, that two new schemes for training as pilots and for obtaining Commissions would be available for National Service men in the R.A.F. It is intended so far as possible to continue the men's training in their own trades and to give them productive employment in their own kind of work and it is hoped that many

of the men will be sufficiently attracted by the Service to take on regular engagements. Pilot training will be offered to 300 selected entrants a year, and not fewer than 500 Commissions will be given to National Service men in the ground branches. Men educated to school certificate standard and medically fit can apply on call-up to be considered for pilot training. Those accepted will be asked to agree to serve in the R.A.F.V.R. or the R.Aux.A.F. when their period of National Service is over. Of the 300 vacancies for pilot training, 100 will be reserved for present and former members of the A.T.C. holding the proficiency certificate, which will also carry other benefits for the recruit. Ground Commissions were previously open only to men with professional qualifications, but the Equipment and Secretarial Branches and the R.A.F. Regiment will now be open also to competition by all National Service men. In addition, qualified teachers will be considered for Commissions in the Educational Branch.

FIGHTER CONTROL UNITS.—Up to the middle of December ten additional Fighter Control Units of the Royal Auxiliary Air Force had been formed since the opening of the new recruiting campaign for this Force in October. The new units are at Belfast, Newcastle-on-Tyne, Inverness, Dundee, Exeter, Plymouth, Castle Bromwich, Leeds, Aberdeen and Middleton. Fighter Control Units need men and women up to the age of about 38 to form part of Fighter Command's raid reporting and control system for Great Britain. A series of regular training exercises for the units began on 9th January. Speaking at a recruiting drive for the local unit at Bath on 9th December, Air Marshal Sir Hugh Saunders, Air Council Member for Personnel, said: "Britain's frontier is her Radar Chain. Without it and without Fighter Control, backed by the Royal Observer Corps, we cannot give the early warning which the fighters and guns must have, or direct them to the attack; nor should we have proper means of detecting minelaying aircraft or surface vessels trying to sneak into our seaways and estuaries under cover of darkness, or denying us the Western Approaches upon which depend our life-lines to America and Canada."

MCKENNA CUP AWARD.—The McKenna Cup, presented to the student passing out top of the annual Empire Test Pilots' Course, was won in 1948 by Lieutenant (A) J. Elliot, R.N. This is the first occasion on which this award has been won by a naval officer. Sponsored by the Ministry of Supply at the Empire Test Pilots' School, Farnborough, the course lasts nine months and is attended by some 30 or more selected candidates from the various Commonwealth Services concerned with aviation. In 1948, the seventh year, there were six naval candidates.

IMSHI MASON PRIZE.—An inscribed bronze plaque, to be known as the Imshi Mason Memorial Prize for Air Firing, has been accepted by the Air Council from Mrs. Teresa Mason, of Blackpool, for presentation to the R.A.F. Mediterranean and Middle East Command in memory of her son, Squadron Leader Ernest Mitchelson Mason, D.F.C., R.A.F., who was killed in action on 15th February, 1942, while leading Nos. 94 and 121 Squadrons against the enemy in the Middle East. The trophy will be competed for annually by flying squadrons in the Command and awarded for the best results in weapon efficiency.

NEW BADGES.—As the badge for the R.A.F. Station, Cranwell, Lincolnshire, the King has approved an eagle, wings expanded and inverted, perched upon a rock, and the motto "Alitum Altrix" ("Nurturer of the Winged"). For the R.A.F. Station, Finningley, Yorkshire, the badge approved is, in the language of heraldry, "in front of a sprig of oak, a rose," with the motto, "Usque Ad Coelum Fines" ("Extending as far as the Skies").

ANNUAL MEDICAL EXAMINATION.—The annual medical examination of all R.A.F. officers, suspended during the War owing to the administrative work involved, is to be re-introduced from May, 1949. Unit medical officers will conduct the examinations each year during the months of May and June.

NEW LEAVE SCALES.—New leave scales for the R.A.F. have now been introduced. For Regular officers and airmen the basic leave allowance for home service remains at

30 days a year. An extra 12 days will be given to officers, Warrant officers and flying personnel at the discretion of commanding officers, and to airmen instructors. When pre-war scales of leave for Crown servants generally are restored, officers of the rank of Flight Lieutenant and above may be given a further 19 days for overseas travel or other purposes calculated to improve their efficiency and value to the Service, but this leave will not be granted in consecutive years. Leave is also given for public holidays, and twelve 48-hour passes (normally confined to week-ends) may be granted during the year. A 48-hour pass may be added to the period of annual leave three times a year. For those serving in North-Western Europe the scale is 52 days' leave a year. A married man joined by his family will normally take this leave locally, but others may take 42 days of it in the United Kingdom. Disembarkation leave from N.W. Europe is 21 days for men returning home with their families, and seven days for others. In other Overseas Commands the leave scale is the same as for home service. Disembarkation leave is 14 days after six months abroad, plus one day for each additional month. Part of the annual leave may be saved until returning to the U.K., and added to disembarkation leave, but the total must not exceed 60 days. National Service men joining the R.A.F. from 1949 will be eligible for 14 days' annual leave if serving at home, and 21 days if abroad, with additional leave for aircrew trainees.

Royal Observer Corps

The Air Ministry on 23rd November, issued an appeal for 15,000 more volunteers for the Royal Observer Corps. More than 13,000 volunteers had already joined, but the Ministry now asks men and women who are unable to undertake spare-time service in the Royal Auxiliary Air Force or the R.A.F. Volunteer Reserve to consider service with the R.O.C. as an alternative. Training is for a minimum of three hours a month, and the commitment in the event of an emergency is 12 hours a week. A grant is given to cover out-of-pocket and travelling expenses. Uniforms are provided free. The Headquarters of the Corps are at Bentley Priory, Stanmore, Middlesex, and the Scottish Area Headquarters at 14, Carlton Terrace, Edinburgh, from which details of the nearest R.O.C. group to the applicant's home can be obtained.

Royal Auxiliary Air Force

No. 501 Squadron.—The Duke of Gloucester, as Honorary Air Commodore, on 9th October, visited and inspected No. 501 (County of Gloucester) Squadron, R.Aux.A.F., at Filton, Bristol.

No. 3507 F.C. Unit.—Air Commodore E. Cadbury, D.S.C., D.F.C., has been appointed Honorary Air Commodore, No. 3507 (County of Somerset) Fighter Control Unit (12th December, 1948).

Women's Auxiliary Air Force

Appointments.—The following were announced on 19th December :—

Group Officer M. H. Barnett to be Deputy Director, W.A.A.F. (2).

Wing Officer Lady Seton to be Inspector of W.A.A.F., with the acting rank of Group Officer.

Promotion.—The following was announced on 19th December :—

Wing Officer J. L. A. Conan Doyle, O.B.E., to be Acting Group Officer.

Last Service Group.—All members of the W.A.A.F. are now volunteers serving on extended service or fixed term engagements. In November, 1948, the release took place through 101 Personnel Disposal Centre at R.A.F., Warton, Lancashire, of some 300 of the remaining airwomen who entered under war-time arrangements, except those who had voluntarily postponed their release. Since July, 1945, only volunteers have been accepted for the Force, and since July, 1947, they have signed on for two or three years at choice. Pending the introduction of the permanent Women's Royal Air Force, airwomen may apply to extend their service.

The Berlin Air Lift

The 9th January was the 200th day of the Soviet blockade of Berlin. It was on 23rd June that the Soviet authorities, on the plea of "technical difficulties," closed the railway between Berlin and Helmstedt in the British zone. Traffic by road along the autobahn had already been suspended in April.

The Berlin air lift (Operation "Plainfare") started on 28th June. On 4th December, the Air Ministry News Service stated that R.A.F. aircraft engaged in the lift had flown more than 10 million miles. They had carried 132,000 tons of freight into the city, and on return flights had carried 24,274 passengers, about 3,500 tons of freight, and 20,500 lbs. of mail.

Sunderland flying-boats of the R.A.F. Coastal Command were withdrawn from the lift on 15th December, as Lake Havel, near Berlin, was liable to freeze in the near future. It was expected they would return in the early Spring of 1949. Since they started operating from Finkenwerder, near Hamburg, on the Elbe, and Lake Havel on 6th July, they had made over a thousand return flights and carried some 5,800 tons of freight to the city.

DOMINIONS AND COLONIES

AUSTRALIA

Visit of Lord Douglas.—Marshal of the R.A.F., Lord Douglas of Kirtleside, left England on 16th November for Australia, on a goodwill visit to the Royal Australian Air Force on the invitation of the Commonwealth Government. He is the first senior officer of the R.A.F. to undertake such a visit since the end of the War. He inspected air establishments and met former comrades of the R.A.A.F.

Jet Fighters.—The Commonwealth Government, said a Melbourne message on 4th November, has decided to build the Hawker N.7, jet fighter aircraft, and also a twin-jet attack bomber on the secret list in the United Kingdom. Australian manufacture of the Rolls-Royce "Nene" jet engine will be expanded to supply these types. "Vampire" fighters were already being built in Australia.

CANADA

Jet Fighters.—Mr. Claxton, the Minister of National Defence, announced on 25th November, that the first of two jet interceptor fighter squadrons was then being organized at the R.C.A.F.'s new operational training establishment at St. Hubert, in Quebec Province. It will train with "Vampire" jet fighters, and its crews will include war-time pilots as well as those who have gained their wings since the War ended.

SOUTH AFRICA

"Vampire" Fighters.—The South African Government has decided to buy de Havilland "Vampire V." ground-attack fighters for the South African Air Force. The initial contract is for a squadron of ten aircraft. The S.A.A.F. thus becomes the tenth air force to adopt the "Vampire," the others being those of Britain (for both the R.A.F. and the Royal Navy), Sweden, Switzerland, Norway, France, India, Canada and Australia. The aircraft for South Africa will be built and equipped to R.A.F. standards and will be powered by the de Havilland "Goblin 2" turbo-jet engine of 3,000 lb. static thrust.

RHODESIA

Memorial.—The Dean of Westminster, Dr. Don, dedicated on 26th December (St. Stephen's Day), a frontal on the new altar of the Holy Cross in Westminster Abbey in memory of Rhodesian pilots of the R.A.F.V.R. who lost their lives in the War. The frontal, which has been given anonymously, is a damask of rare mohair material, and is believed to have been woven in the first half of the XIXth Century.

PAKISTAN

A.O.C.—The Pakistan Defence Ministry announced in Karachi on 10th December, that Air Vice-Marshal R. L. R. Atcherley would succeed Air Vice-Marshal A. L. A. Perry-Keene as Air Officer Commanding the Pakistan Air Force in March, 1949.

MALAYA

NEW BADGE.—A badge for the R.A.F. Regiment (Malaya) has been approved by the King. It consists of two kris in saltire surmounted by an astral crown. The motto is written in Malayan script, and translated means "Never Retreat." The original of the badge was presented by Air Vice-Marshal A. C. Sanderson, Air Officer Commanding, Malaya, to Wing Commander C. B. Abbott, Officer Commanding, R.A.F. Regiment (Malaya), at a ceremony in December, at the R.A.F. Station, Sembawang, Singapore.

CHANGI AIR BASE.—It was officially announced in Singapore on 30th December, that it had been decided not to proceed further with the development of Changi as a joint civil and R.A.F. airport. The runway at Changi will now be completed for R.A.F. purposes only. The existing R.A.F. airfield at Tengah, subject to satisfactory results in a technical survey to be made soon, will now be developed as the joint R.A.F. and civil airport for Singapore to meet the needs of the heavy aircraft of the future.

FOREIGN AIR FORCES

BELGIUM

AIR FORCE TRAINING.—It is reported that part of the training of the Belgian Air Force will eventually be carried out at a new base to be established in the Belgian Congo.

FRANCE

FLYING DUTY PAY.—The French Defence Ministry has issued a decree laying down the basis for payment of Flying Duty Allowances. All flying grades of the Air Force and Naval Air Service will be entitled to these payments. Allowances will be at the rate of a 50 per cent. addition to basic pay for all trained aircrew; those under training will receive a 25 per cent. addition to their basic pay.

NEW TRAINING CENTRE.—A new training centre for Air Force Engineer and Signals Officers opened at Versailles on 1st January, 1949. The main function of the centre is training and selection of junior officers for higher technical posts.

TRAINING FLIGHT.—The French Air Force College, Salon, is carrying out a training flight over Africa commencing in January, 1949. The Commanding Officer of the College, four instructors, forty-eight second year pupils and eight officers will fly to Madagascar. The whole trip is expected to take twenty-six days. A similar flight was undertaken during February and March, 1948, when sixty-seven pupils from Salon made a tour of French Air Force Stations in North Africa in four Dakotas of the Air Force Transport Command.

HOLLAND

1949 ESTIMATES.—The 1949 Estimates for the War Ministry exceed those for 1948 by about £4,000,000. These estimates include provision for an Army Air Force average strength of 7,500 officers and airmen.

ITALY

During a debate on the Defence Estimates, the Italian Defence Minister recently admitted that the Air Force was in a precarious state. He stated that apart from 48 Mustang fighters and 31 S.M.82 transports all its present aircraft would be unserviceable by the end of 1949.

It is reported that the Italian Air Staff has now worked out a four-year programme for the re-equipment of the Air Force. This programme is said to stipulate that contracts should be placed exclusively with Italian manufacturers.

RUSSIA

The Aeroplane of 31st December last, reports the claim in a Russian Science Magazine that a rocket-propelled aircraft, designed by Yakovlev, has flown at speeds considerably greater than that of sound. The British publication remarks that this may be a development of the German D.F.S.238 rocket monoplane—the only known Russian type potentially capable of supersonic speeds.

UNITED STATES

CONTINENTAL AIR COMMAND.—The U.S. Air Force have begun to organize a Continental Air Command designed to strengthen the Air National Guard and the Air Reserve programme and to provide for Air Force Command areas identical with those of the Department of the Army.

The new Command will be headed by Lieut.-General George E. Stratmeyer, and will include all the units and functions now assigned to the Air Defence Command and the Tactical Air Command, which will continue as operational headquarters at their present locations under the new organization.

Under the new organization the Continental Air Command will assume direct control over regional Air Forces to which all units and stations presently controlled by the Air Defence Command and the Tactical Air Command will be transferred. Each of these Air Force Commands will be responsible for Air Force matters within the same areas served by each of the six Departments of the Army areas, so that the two Services will have closer co-ordination. The plan was drawn up by mutual agreement between the Department of the Air Force and the Department of the Army.

The Continental Air Command will have its headquarters at the Mitchell Air Base, New York.

The 9th and 12th Air Forces, at present under the control of Tactical Air Command, will become Geographic Air Forces, as will the 1st, 4th, 10th and 14th Air Forces which at present are under the control of the Air Defence Command.

The Air Force and Army Command areas will have identical geographical limits as under :—

1st Army	1st Air Force.
2nd Army	14th Air Force.
3rd Army	9th Air Force.
4th Army	12th Air Force.
5th Army	10th Air Force.
6th Army	4th Air Force.

SPECIAL TRAINING FLIGHTS TO ALASKA.—It was recently announced that between 1st November, 1948, and 1st March, 1949, the 43rd Bombardment Group of Strategic Air Command will send three detachments of five B-50 four-engined bomber aircraft to Alaska for special training. Each detachment will remain in Alaska for forty-five days, the object being to give both air and ground crews experience in operating these aircraft under Arctic conditions. The 43rd Bombardment Group is based at Davis-Monthan Air Force base, Arizona. It is the only group at present equipped with B-50 aircraft.

Personnel

The following table shows the actual strength on 1st October, 1948, and the estimated strength on 1st November, 1948, of Air Force personnel overseas and in the United States, Air Reserve personnel, Air National Guard, Air R.O.T.C., and enlistments.

	1st November (Estimated)	*1st October* (Actual)
Enlisted personnel	355,100	355,414
Warrant officers	1,245	1,241
Officers	50,855	50,433
Total	407,200	406,088
Personnel overseas	130,200	129,774
Personnel in U.S.	277,000	276,314
Total	407,200	406,088
Air Reserve Personnel—		
Officers assigned organized units	Reported each Quarter	21,254
Enlisted men to organized units		22,066
Total		43,320
Officers assigned composite units	Reported each Quarter	32,982
Enlisted men to composite units		8,929
Total	—	41,911
Air National Guard—		
Officers	—	4,670
Enlisted men	—	25,166
Total	—	29,836
Air R.O.T.C.—		
Elementary	15,000	15,000
Advanced	6,000	6,000
Total	21,000	21,000
Civilian Personnel, U.S.*	127,600	125,783
Enlistments during	*October*	*September*
New	6,661	7,452
Re-enlistments, prior service	9,660	3,634
18-year-olds, one-year terms	633	946
Total	16,974	12,032

* There is no available breakdown on U.S.A.F. civilian personnel overseas since such personnel are under the administration of the Army.

Material

On 30th November, 1948, the U.S. Air Force had a total of approximately 23,000 aircraft; these included 13,000 active and 10,000 inactive (in storage). Of the 13,000 in the active category, 6,500 were of the combat-type, and 6,500 were utility type. Of the 10,000 in storage, 6,000 were combat-type and 4,000 were utility aircraft.

These figures include Air Reserve, Air National Guard, and Civil Air Patrol aircraft. The Active category includes all aircraft not in storage; these are not necessarily all immediately ready for combat duty.

Fewer than three-quarters of the combat-type listed above are "first-line" aircraft, a simplified but not complete definition of which is that they are the most modern aircraft of their type, still capable of performing their primary mission within the normal life-span of that type.

DOUGLAS D-558 SKYROCKET.—This aeroplane has exceeded sonic speed in shallow dives using only the 3,000 lb. thrust Westinghouse 24C turbo-jet engine as power. The tests so far carried out have examined the stability and control of this swept wing research aircraft in the transonic zone using only jet power. The Skyrocket is now being prepared for rocket-powered supersonic flight tests, which are expected to exceed the performance of the Bell XI by a substantial margin. The D-558 is designed to attain a Mach No. of 1.4 for research tests and is theoretically capable of Mach No. 2.75 (1,820 m.p.h. at high altitude). The Bell XI was designed for 1,700 m.p.h. at 80,000 feet.

SALE OF MODERN MILITARY AIRCRAFT TO SOUTH AMERICAN COUNTRIES.—Under terms of a recent agreement between the U.S. State Department and the U.S.A.F., South American countries may purchase four types of new or surplus military aircraft on the open market. Provision is made in the agreement that such purchases will not be approved if they are likely to endanger the national security or interfere with U.S.A.F. procurement. The aircraft which have been approved for inter-American purchase are :—

(*a*) Lockheed F-80 "Shooting Star" (jet fighter).
(*b*) North American F-82 "Twin Mustang" (twin-engined fighter).
(*c*) Republic F-84 "Thunderjet" (jet fighter).
(*d*) Fairchild C-82 "Packet" (twin-engined transport).

Potential purchasers of the aircraft must confirm that they will be used by them for military purposes only and will not be re-sold.

CONVERSION OF FLYING WINGS TO JET ENGINES.—The U.S.A.F. recently announced that ten of the thirteen B-35 "Flying Wings" are being converted from reciprocating engines to turbo-jet engines. This work is now in progress at the Northrop Aircraft Plant at Hawthorn, California. The remaining three B-35s will continue to be used for static tests and further flight testing. The jet engined "Flying Wings" are designated the B-49 and it is assumed that the ten B-35s will be re-designated B-49.

BOMBER CATEGORIES.—The category of "Very Heavy Bomber" has been dropped, and the three categories now used are "Heavy Bomber," "Medium Bomber" and "Light Bomber." The only aircraft at present in service classified as a "Heavy Bomber" is the B-36. The B-29, or Superfortress, is known as a "Medium Bomber."

NEW BOMBER.—On 26th November last, delivery was made of the first B-36B. It is claimed that this aircraft has a 10,000 mile range with a 10,000 lb. bomb load.

NEW FIGHTERS.—It has been announced that the two new aircraft built by the McDonnel aircraft Corporation have now been named. The first, the XF-85, has been named "Goblin." This aircraft is a single jet engined parasitic fighter, designed to be carried in the fuselage of the B-36 six-engined heavy bomber as a defensive fighter. This aircraft has recently made its first flight from a B-36 and successfully hooked itself on to the mother aircraft at the end of its flight.

The other aircraft is the XF-88 which is to be known as the "Voodoo." This is a twin-engined penetration fighter.

NEW AIR TRANSPORT TYPE.—The first of the twin C-121 aircraft ordered by the U.S.A.F. recently completed its first test flight at Burbank, California. The C-121 is the military version of the Rocket Constellation and will be assigned to the military air transport service when delivered. Nine of the aircraft will be used for carrying freight and the other will be used for the transportation of high Government executives.

REVIEWS OF BOOKS

GENERAL

Weather Forecasting. By Instructor-Commander S. W. C. Pack, R.N. (Longmans.) 25s.

Admiral Sir Arthur Power, in his foreword to this book, gives details of the author's wide experience as a Meteorological Officer in the Royal Navy. For a period, his duties included the training of Naval Meteorological officers in their qualifying course. Instructor-Commander Pack, therefore, is well qualified to write a book, which, as he states in the preface, is intended " to provide an introduction to students who are about to specialize in meteorology " and " to be of general interest to senior students in schools."

For these two purposes, he has undoubtedly produced a very comprehensive volume : in some respects, perhaps, it is too comprehensive. Ranging from a description of a thermometer to the construction of an upper air chart, the author has tended to deal too briefly with some of the important aspects of the science of meteorology in order to include details which the student could well wait to learn in the course of his studies and practical work. As one example, it would hardly seem necessary for one about to specialize in meteorology to know, before his course starts, the principles on which the Isothermal and I.C.A.N. altimeters are graduated. If necessary, he will learn them later in much more detail.

From Chapter 8 to the last Chapter 27, the book follows the lines of similar books on the subject, though the treatment of it is novel. The author describes the many complicated processes of the weather in simple terms, illustrating his text with diagrams. He has deliberately omitted mathematical explanations and proof. All this leads to the simplicity so desirable in an elementary text book of this nature ; but here and there, in his search for brevity, he is apt to become obscure. For instance, after the brief description of the highly complicated and important processes of Convergence and Divergence, most readers will still be asking " Why does Divergence contribute to Frontolysis ? " On the whole, however, the author has succeeded, with the aid of his illustrations, in providing a simple and understandable explanation of most of the basic principles of meteorology.

A student must have a sound basic knowledge of the science of meteorology before he can attempt to practise the art of forecasting, and this book is designed to provide that knowledge ; but its application to forecasting is, perhaps, more a matter of experience than of learning. Nevertheless, the author does his best to help, though it might have been better to have given a more detailed explanation of a weather chart and its construction than is provided in Chapter 2. The chapter on " Analysis and Forecasting " is good.

The Appendices include the new International Meteorological Codes and plotting symbols, which came into force on 1st January, 1949. They are in a handy and concise form and will be of use to students and others.

A Miscellany of British Flags. By Captain G. G. Thorne, R.D., R.N.R. (Brown, Son and Ferguson, Ltd.) 2s. 6d.

This small book gives an admirable and concise account in simple language of the Flags now used by the Royal Navy and the Merchant Service, with interesting references to their origin.

There is a detailed account of the origin and composition of the Union Flag, from the adoption of the red cross of St. George early in the XIIth Century to the establishment of its present form, including its association with the Red, Blue and White Ensigns, special Jacks, House Flags, etc., culminating in a description of customs to be observed when hoisting and lowering flags, dressing ship and other maritime ceremonial.

NAVAL

The Bismarck Episode. By Captain Russell Grenfell, R.N. (Faber and Faber.) 12s. 6d.

The sea battle which resulted in the destruction of the German battleship "Bismarck" was the climax, not only of several days of anxious hunting by ships and aircraft of the Home Fleet and other units, assisted by the R.A.F., but also of a phase in the war at sea, for never again did the German surface warships dare to challenge our control of the Atlantic seaways.

The account of how this great ship, from the moment she was first reported steaming northward in the Kattegat, and after six anxious days of chase, was brought to action and sunk, is here told in a stirring and lucid narrative. The author has obviously been at great pains, not only to check the accuracy of his statements but also, by interviewing so many officers of all ranks who took part in the action, to introduce a very human element into what might otherwise be merely factual history. The story, however, is told entirely from the British point of view, so with the exception of a few footnotes we get little idea of what was happening in the German ship or what was passing in the minds of our enemy. No doubt, when all the German documents are available many of the outstanding questions can be answered.

After giving a brief survey of the strategic situation in May, 1941, the author describes the scene in the cabin of the Commander-in-Chief, Home Fleet, on the morning of 21st May, when the first news was received of the "Bismarck's" departure from Germany. The problem which confronted Admiral Sir John Tovey and the courses of action open to him are clearly presented. The anxious wait for news is followed by the information, obtained at great hazard, that the enemy had left the Norwegian fiord; the movements which the Commander-in-Chief had planned are set in motion. Then a further period of anxious waiting is broken by the sighting of the "Bismarck" and her escort the cruiser "Prinz Eugen" in the Denmark Straits. The difficulty of maintaining touch in the appalling weather conditions prevailing at the time are well described.

Then comes the disastrous action in which "The Mighty Hood" was destroyed, although not before she had secured the first hit on the enemy. The author digresses here to blame inter-war parsimony in delaying the money for modernizing the ship until too late, as being partly culpable. The tactics employed by Vice-Admiral Holland also come in for strong criticism. But surely the Vice-Admiral must have been aware of the extreme vulnerability of his unmodernized ship to plunging fire, and therefore had good reason to get into a range at which his side armour would afford him some protection; so is the author justified in saying "But it was early in the morning and the British ships had plenty of time. Why then the hurry to get in?" However, the reader is given the facts and can judge for himself.

The wave of optimism which passed over the Fleet when the "Bismarck" was found gives way to one of grim determination to avenge the loss of the "Hood." We are shown step by step how the Commander-in-Chief planned to deal with this unexpected and dangerous situation. The scene at the Admiralty is described telling us how the Naval Staff, keeping in touch with the situation, controlled the movements of the widely dispersed forces—many not under the direct command of Sir John Tovey. In conditions little short of desperate the first air attack is launched from H.M.S. "Victorious," gaining one hit; but shortly after gloom again descends when contact is lost.

Then follows a description of the anxious search in rough seas, rain squalls, low visibility, and thick cloud, for the elusive enemy, eventually found by the R.A.F. and Fleet Air Arm and fixed by the "Sheffield." We are told about the anxieties of the Flag Officers and the strain on Commanding Officers and their crews who are constantly on the alert looking for their prey. Fuel is running short and it begins to look as if the chase will have to be abandoned, when a torpedo from one of the "Ark Royal's" aircraft scores a hit which turns the fortunes of war once more in our favour. Hopes rise again;

but the chase is by no means over. Captain Vian, taking his destroyers to search for the enemy on his own initiative, arrives just in time to take over when the shadowing aircraft are forced to leave. And so we are brought to the climax when the Commander-in-Chief arrives in the " King George V " and with the " Rodney " takes up the fight until the " Bismarck "—" a silent, battered wreck " is sunk by the " Dorsetshire's " torpedoes.

The story cannot fail to interest. Technical points—and there must be many—are simply explained so that the non-technical reader need have no fears; whilst for the more technically minded the author brings out many points which are sure to produce a good many naval " cags." Our lack of adequate facilities for fuelling at sea; our complacency in accepting so long a period of " teething troubles " with new types of guns; whether the destroyers were justified in jeopardizing their object by attacking with torpedoes during the night—these and many other contentious points are raised.

Finally the author draws the important deductions that the " Bismarcks' " destruction was ". . . the fruit of co-operative action on the part of numerous sea and air forces, the latter partly naval and partly R.A.F. all working in close accord for the one common end. . . ."

The Durable Monument—Horatio Nelson. By Admiral Sir W. M. James, G.C.B. (Longmans Green and Co.) 15s.

This may be described as a " popular " life of Nelson, in that it is written in easy narrative form with a good collection of portraits and a few simple maps and plans which should combine to make it attractive to a wide circle of readers.

Admiral James was specially inspired to write it by the fact that he flew his flag in H.M.S. " Victory " and used Nelson's old ship as his headquarters after he had been bombed out of his C.-in-C's house in Portsmouth during the late war. He has evidently been at pains to capture the personality of the true Nelson, as well as to retell the story of his great achievements. Perhaps without intending it, he has been almost over-anxious to portray the idiosyncrasies as well as the fine qualities of a highly complex character for, though he makes it plain that he is second to no one in his profound admiration of the hero as a brilliant commander, an inspiring leader and an endearing friend, yet he depicts the man as a supreme egotist, often an intolerant subordinate and, when his mind was not fully occupied by fighting, almost a chronic hypochondriac. Some allowance can be made for the impression of egotism given by Nelson's letters and utterances as being more in keeping with the modes of those days than of the present times. The intolerance, which at times amounted almost to insubordination, we can nearly always trace to his burning zeal and inability to suffer fools—especially old fools—gladly. Much of his complaining of his state of health was undoubtedly genuine enough, for he had been sorely battered and strained in the service of his Country. It might have been better if these extenuations had been advanced more specifically by the author in a book which will be read by many to whom they will not be sufficiently apparent.

One serious criticism must be of the plan of the disposition of the fleets just before they joined action at Trafalgar. This perpetuates the erroneous conceptions which prevailed before the investigation of the Admiralty Committee in 1912, and which were not finally dissipated until the R.U.S.I. Committee, presided over by Admiral Sir William Goodenough, corrected the model in the Museum in 1937. Readers of the JOURNAL will recall the lecture on the subject given by Rear-Admiral A. H. Taylor which, with a correct plan, was published in the number for November, 1937. A series of plans showing the positions of each ship in the rival fleets at consecutive times during the action, worked out by Admiral Taylor, are kept in the Library, and are probably the last word on how Trafalgar was fought.

For the rest, this is an enthralling biography, written in the author's always vivid, human and fascinating style.

Walker's Groups in the Western Approaches. By Commander D. E. G. Wemyss, D.S.O., D.S.C., R.N. (Liverpool Daily Post & Echo.) 12s. 6d.

The leading figure at sea in the war against the German U-boats was the late Captain F. J. Walker, C.B., D.S.O. and three bars, Royal Navy, whose principal exploits were accomplished while he was in command, first of the 36th Escort Group and later of the famous Second Support Group. This book by Commander Wemyss, who was Captain of H.M. Sloop "Wild Goose" in the Second Support Group, tells the tale of some of the exploits of these two Groups and also of that great leader.

There is a foreword by Admiral Sir Max Horton, one of the Commanders-in-Chief, Western Approaches, who so successfully directed our naval forces in the Battle of the Atlantic. Referring to Captain Walker, he says: "In my opinion, no single officer at sea did more than Frederick John Walker to win this battle." To emphasize all that was at stake, he quotes Mr. Churchill's famous words in 1944:—

> "When I look back upon the 55 months of this hard and obstinate war . . . I still rate highest among the dangers we have overcome, the U-boat attack on our shipping, without which we cannot live or even receive the help which our Dominions and our grand and generous American Ally have sent us."

The book starts with a broad picture of the U-boat war as a background, and goes on with a chapter on "The Boss"—Captain Walker. A true picture of his personality does not really emerge from this early chapter. But it comes out clearly from the remainder of the book, which shows him to be a great leader—one who formed his team into a true band of brothers, who understood exactly what was expected of them and did it at once and without further orders. After a final twenty minutes concerted and successful action by the Second Support Group against a U-boat, forced at last to surface, Captain Walker made his *first* signal of the action as she disappeared from view, "Cease firing. Gosh, what a lovely battle." One is reminded of Nelson's paucity of signals and of Admiral Vian's solitary signal for his convoy action with the Italian battlefleet in March, 1942—"Carry out Plan 1."

The descriptions of the various actions of the Group, though at first not very gripping in themselves, have a cumulative effect. At the end, the reader is left with a vivid picture of life in the Escort Group, the long periods of unending routine and search, culminating at times in all the excitement of a hunt. It makes clear, too, how long this final hunt to the death often took, and the powers of physical and mental concentration and endurance that were required.

The book is well produced, has many excellent photographs, and is well worth reading. It conveys a broad picture of the work of our Escort and Support Groups in the Atlantic. Above all, it is a tribute to Captain Walker, to the trust and confidence that he inspired and to the success which was bound to follow.

'The Med'—The Royal Navy in the Mediterranean, 1939–45. By Rowland Langmaid. (The Batchworth Press, London.) 21s.

Lieutenant-Commander Langmaid served throughout the 1939–45 War as the official naval artist on the staff of the C.-in-C. Mediterranean Fleet, and this book is his own view of the fighting afloat in those waters.

The letter-press is written in the form of a potted history of the principal events and their participants—men and ships, interwoven with a personal narrative. The main feature of this publication, however, is the collection of 57 delightful black and white pictures by the artist-author. Although not so colourful as the reproduction of his water-colours in that pre-war gem, *The King's Ships through the Ages*, these still bear the hall-mark of the true naval artist—his ships *are* ships, his seas alive and "wet."

We have had many well got-up war booklets, illustrated with well taken and selected photographs; but Langmaid has succeeded in conveying what happened and, still more, what it looked like, much more realistically. It is a joy to see work of this sort in the

pictorial recording of at least one great theatre of the War, after the mass of crude, modernist horrors which masqueraded as " art " in the case of so many war pictures, an undue number of which, incidentally, were of subjects or incidents well removed from active service.

Lee-Oh. By Lieutenant-Commander A. J. Cobham, G.C., R.N. (Underhill (Plymouth) Ltd, 1948.) 1s. 0d.

While this is modestly described as " a guide to enjoying the sport of Sailing," that sport provides experience in practical seamanship which may be of great value to any officer who may find himself engaged in amphibious operations. The handling of small craft is now by no means confined to the Navy, and, in emergency, anyone in any of the Services may find himself " in charge " or called upon to " bear a hand." For that reason alone this admirable little seamanship booklet can be strongly recommended.

ARMY

The Predecessors of the Royal Army Service Corps, 1757–1888. By Lieut.-Colonel C. H. Massé, M.C. Illustrated by C. C. P. Lawson. (Gale and Polden.) 15s.

Tracing the genealogy of the Royal Army Service Corps is one of the most intricate puzzles in British military history, and Colonel Massé's account is as lucid as it is interesting. He tells how, until 1869, a civilian Commissariat was responsible for Supply, and military waggoners were responsible for Transport. The result was constant friction between the two, and whenever anything went wrong the Load blamed the Waggon and the Waggon blamed the Load.

The first uniformed transport corps was the Royal Waggoners which was raised for service in Holland in 1794. This corps was disbanded in 1795, to be followed in 1799 by the Royal Waggon Corps, later the Royal Waggon Train. It lasted until 1833, but it was not until 1855 that the chaos in the Crimea caused the formation of the Land Transport Corps, which is the true ancestor of the present R.A.S.C. The Land Transport Corps was more fortunate than its predecessors in that its opposite number, the Commissariat Department, was under the War Office instead of the Treasury, but the old jealousies continued, fed on inefficiency.

In 1856 the new corps became the Military Train, and a battalion was equipped as Light Cavalry, which did some fine combatant work in the Indian Mutiny, including the capture of two guns and the winning of two V.C.s. Good as this was for morale it had its adverse side, for the soldiers of the Transport service, imbued as they were with martial ardour, resented more than ever taking orders from the civilian Supply officers.

In the days when Sir Solomon Medina supplied bread to Marlborough's men, armies lived on the country over which they fought, and there was something to be said for a civilian supply service acting directly under the Treasury. But the XIXth Century saw the seat of war moving to remoter lands, and the vital question was not how to find supplies, but how to get the supplies to the fighting man. For instance the troops before Sevastopol went short of rations not because there were none, but because of the difficulty of transporting the adequate rations over the ten miles of mud from Balaclava to the trenches.

The Commander of the Military Train in 1859 realized the hampering effect of dual control and stated that the Commissariat and Transport services should be united. Somewhat belatedly, in 1869, this was done, and after twenty years of muddled nomenclature the various Staffs, Departments, and Corps became the Army Service Corps.

Dual control had sung its swan-song in Abyssinia in 1867–8, and the new organization was first tested on active service in the bloodless Red River Expedition, the Ashanti War of 1873–4, and in South Africa, where Commissary James Dalton won the V.C. at Rorke's Drift. It was well into its stride when Arabi Pasha revolted, and in the amphibian

operations in the Sudan in 1884–5 the foundations were laid for the gigantic tasks with which it has since had to cope.

Colonel Massé blends the details of formation with spirited historical narrative and deals fully with changes of uniform. Here he is helped by the excellent black and white drawings of Mr. Lawson, which are a vast improvement on the reproductions, so much like tailors' dummies, which have appeared in many regimental histories. The frontispiece is a table of salient dates, which is a great help in reading the history, if not very decorative. The author has no hesitation in saying when he does not know ; he makes no assumptions ; and these qualities render the authenticity of what he does say all the more convincing.

The book is attractively got up, compact, and well printed. It should have a wide appeal, especially to all past and present members of the Corps, and will prove an invaluable handbook to young officers detailed to lecture on regimental history.

Report my Signals. By Antony Brett-James. (Hennel Locke.) 15s.

This is perhaps the only book, free from technicalities and official flavour, which has appeared concerning the activities of an Army Signal Unit, either British or Indian.

It contains the memoirs of a young wartime officer who joined the 5th Indian Divisional Signals in the Western Desert in August, 1942, and served with that unit, chiefly with infantry brigade signal sections, until he was repatriated from Burma in July, 1945.

The author seems to have acquired a rapid knowledge of the Urdu language and was thus in a position, at a very early stage, to interest himself closely in the individual personalities and idiosyncrasies of the Indian Officers, N.C.O's and men of the sections he commanded. He describes their work, their natural difficulties, and his endeavours to assist them. The book contains many excellent sketches of Punjabi Mussulmans and Madrassis who were members of these sections.

The accounts of training problems, troubles over equipment and transport, dealings with impatient staff officers and other upsets, common in the life of a signal officer, are well drawn.

Descriptions of engagements with the enemy, of prolonged and rapid movement, of monsoon weather in difficult country, and of the success or failure of various means of intercommunication under these conditions are realistic. Life at Brigade Headquarters, visits to battalion and other areas, and journeys during leave periods are well portrayed.

The thoughts and reflections contained in the book are valuable in that they must be typical of the keen young wartime officer who, lacking sufficiently wide experience, can only judge the whole from those things which he sees or hears in his immediate neighbourhood. Inaccurate knowledge of more distant personalities, organizations and events must inevitably result.

Readers must not become impatient over an inclination towards long paragraphs, or with sentences which are sometimes rather involved, especially in the opening chapters. The author warms to his work and a certain quaintness in phraseology becomes attractive in the reading.

This book will be of interest to all who have had experience with the Indian soldier, especially to those who have served with the Indian Signal Corps. It contains some useful matter, too, for those who have failed to appreciate the quiet and continuous work of a key branch of the Service, so often unnoticed until a mistake is made.

Wellington College : The Founders of the Tradition. By George F. H. Berkeley. (R. H. Johns, Ltd., Newport, Monmouth.)

This book is mainly concerned with the story of the struggles of the first two Headmasters of Wellington College who achieved a large measure of success in spite of difficulties and two grave setbacks. It also tells of the enthusiasm and devoted work of Colonel the

Hon. P. Talbot who was connected with the school from its inception until his death, either as Secretary or Governor or Vice-President.

The Duke died in September, 1852, and within a year it was decided to found a school in his memory; the Prince Consort became the first President. He evolved the idea of a military academy on German lines with boys in uniform, but soon after his death the Governors decided to develop the College on the lines of an English public school. How this was done, and the Army tradition maintained, is told in the first part of the book. The second part consists of some interesting records and appendices.

" Wellington was founded," it is stated in Chapter IV, " in order to provide a good and cheap education for sons of officers; but not necessarily to train them for the Army." This seems to have been misunderstood by many officers in the Seventies and, as a result, even the keenest supporters of the school were divided into hostile parties. The whole question was finally settled by a Royal Commission in 1879–80 to which a chapter is devoted.

Dr. Benson, the first Headmaster—who afterwards became Archbishop of Canterbury—was one of the sternest disciplinarians who ever ruled a school, and a man of tremendous energy who tended to over-centralize. By 1870 the College was firmly established. Though started as a semi-military academy, and the course planned " to harden boys for the Service," it was then approaching the stage when it could be ranked as one of the great public schools.

After carrying the burden for over fourteen years, Dr. Benson was succeeded by the Rev. E. C. Wickham an account of whose reign of over twenty years forms the bulk of the book. He introduced many reforms and improvements but still maintained the military tradition. In 1883 over four hundred O.W's were serving as officers in the Army.

The final chapter headed: " The Boys of the First Fifty Years," tells of the sermon Wickham came back to preach at the fiftieth anniversary celebrations when he had reached the age of 76. Judging from the extracts given, much of this sermon of forty years ago is apposite to-day when there seems even more need for the young to learn " lessons of simple living, of truth, and moral courage and self-control."

The book, whilst mainly of interest to O.Ws. to whom the story should be a source of pride, is also worthy of notice by officers generally, especially those responsible for training our future leaders.

REGIMENTAL HISTORIES

The Story of The Border Regiment, 1939–1945. By Major-General P. J. Shears, C.B. (Nisbet and Co., Ltd.) 10s.

This war history of a fine Regiment is full of information—clear, concise and without " literary " frills. It is a plain, unvarnished story, and none the worse for that. It deals with each battalion of the Regiment in turn, and includes a chapter on the Home Guard which is useful as recording the local organization.

As Colonel of the Regiment throughout the War, Brigadier-General G. H. Harrison contributes a foreword containing some interesting comments. To make one quotation:—

> " A system of reinforcement that entailed ' drafting ' men from one regiment to another seemed hard to justify and caused great resentment. I well recall a letter I received from one Commanding Officer of The Border Regiment asking if I had any objection to his forming a pipe band rather than a corps of drums in his battalion, as he had so many Highlanders in his ranks! These things were perhaps inevitable, but none the less they caused much heartburning."

Straight on for Tokyo. By Lieut.-Colonel O. G. W. White, D.S.O. (Gale and Polden, Ltd.) 15s.

This is a war history of the 2nd Battalion, The Dorsetshire Regiment (the old 54th Foot), covering the years 1939–1947. During that period the author served five

whole years with the Battalion and commanded it for nearly three years. His narrative is full and detailed, but easy to read; it will please all friends of the Dorsets. As General Sir Montagu Stopford says in his foreword: "One aspect of military tradition which the story brings out is the tremendous *esprit de corps* which permeated the Battalion."

The Battalion played a distinguished part in the operations ending with the evacuation from Dunkirk; served in England till 1942; then went to India, whence it shared in the Burma campaigns of 1944–1945. After the end of the War it formed part of the British Commonwealth Occupation Force in Japan.

Commando Men. By Bryan Samain. (Stevens and Sons, Ltd.) 10s. 6d.

This is the story of No. 45 Royal Marine Commando in North-West Europe from D-day to V.E.-day. The author was this Commando's Intelligence officer. The book is concise, pleasantly written and well produced, and there are a number of good photographic illustrations.

The Pictorial History of Canada's Army Overseas, 1939–1945. Compiled by F. Whitcombe; narrative by B. Gilmour. (Whitcombe, Gilmour and Co., Montreal.) Price in Canada, 3.50.

Over 700 photographs of good quality are well reproduced in this pictorial war history. The illustrations are skilfully selected, and they are accompanied by an appropriate narrative.

History of the 8th King George V's Own Light Cavalry. By H. G. Rawlinson, C.I.E. (Gale and Polden, Ltd.)

This is a short, concise history of a cavalry regiment of the old Indian Army which traces its descent back to 1787, when the 1st Madras Light Cavalry were formed. Later, in 1903, this regiment became the 26th Light Cavalry, and in 1922 was amalgamated with the 30th Lancers (Gordon's Horse) under the title of 8th King George V's Own Light Cavalry.

The Royal Manx Fencibles. By B. E. Sargeaunt. (Gale and Polden, Ltd.)

"Fencibles" were corps raised by voluntary enlistment for local home defence duty at times when the bulk of the Regular Army was serving overseas. Each Fencible man received a bounty, and his pay and allowances were the same as those for the Regular Army. Unlike Militia units, Fencible corps were not on a continuous service liability.

In this book, in a small space, the author skilfully describes in some detail the history and organization of the four corps of Fencibles which were raised in the Isle of Man for various periods between the years of 1779 and 1811.

ADDITIONS TO THE LIBRARY

(*Books for Reference in the Library only)

GENERAL

THE PRIVATE DIARIES (MARCH 1940 TO JANUARY 1941) OF PAUL BAUDOUIN. By Paul Baudouin. Demy 8vo. 308 pages. (Eyre and Spottiswoode, 1948.) 16s.

CRUSADE IN EUROPE. By Dwight D. Eisenhower. Demy 8vo. 582 pages. (Heinemann, 1948.) 25s.

THE WHITE HOUSE PAPERS OF HARRY L. HOPKINS. Volume I. September 1939–January 1942. By Robert E. Sherwood. Medium 8vo. 491 pages. (Eyre and Spottiswoode, 1948.) 25s.

RAVENSBRUCK. The Women's Camp of Death. By Denise Dufournier. Crown 8vo. 150 pages. (Allen and Unwin, 1948.) 8s. 6d.

CIANO'S DIPLOMATIC PAPERS. Edited by Malcolm Muggeridge. Demy 8vo. 490 pages. (Odhams Press, 1948.) 17s. 6d.

These are a record of nearly two hundred conversations held during the years 1936–42 with Hitler, Mussolini, Franco, Goering, Ribbentrop; Chamberlain, Eden, Sumner Welles, Schuschnigg, Lord Perth, François-Poncet; and many other world diplomatic figures; together with important memoranda, letters, telegrams, etc.

WAR CRIMES TRIALS. Volume III. TRIAL OF GOZAWA SADAICHI AND NINE OTHERS. Edited by Colin Sleeman. Demy 8vo. 245 pages. (Hodge, 1948.) 18s. Presented by the Publishers.

MR. PRESIDENT. An Introduction to American History. By Maurice Ashley. Medium 8vo. 448 pages. (Jonathan Cape, 1948.) 21s.

A SHORT HISTORY OF THE MIDDLE EAST FROM THE RISE OF ISLAM TO MODERN TIMES. By George E. Kirk. Demy 8vo. 301 pages. (Methuen, 1948.) 16s.

BRITISH MALAYA. An Account of the Origin and Progress of British Influence in Malaya. By Sir Frank Swettenham. Demy 8vo. 380 pages. (Allen and Unwin, 1948.) 21s.

NEW ZEALAND. Edited by Horace Belshaw. Demy 8vo. 329 pages. (University of California Press, 1947.)

A record of New Zealand's discovery and exploration, history, economic and social progress, cultural development, government and foreign policy.

COMMERCE AND CONQUEST. The Story of the Honourable East India Company. By C. Lestock Reid. Demy 8vo. 256 pages. (C. and J. Temple, 1947.) 12s. 6d.

THE UNITY OF EUROPEAN HISTORY. A Political and Cultural Survey. By John Bowle. Medium 8vo. 383 pages. (Jonathan Cape, 1948.) 18s.

THIS WAS MY CHOICE. By Igor Gouzenko. Large post 8vo. 324 pages. (Eyre and Spottiswoode, 1948.) 10s. 6d.

The author fled from the Soviet Embassy in Canada where he was employed as a cipher clerk, and gave evidence in the Canadian Spy Trials. This is the story of his Communist life.

DIMITROV WASTES NO BULLETS. Nikola Petkov: The Test Case. By Michael Padev. Demy 8vo. 160 pages. (Eyre and Spottiswoode, 1948.) 5s.

This is described as " the inside story of the trial and murder of Nikola Petkov " by a personal friend who was also for some time the representative of the post-war Bulgarian Government in London and Washington.

INQUEST ON AN ALLY. By Paul Winterton. Demy 8vo. 288 pages. (Cresset Press, 1948.) 12s. 6d.

A study of Russian external politics since the War.

THE PATTERN OF SOVIET DOMINATION. By Stanislaw Mikolajczyk. Demy 8vo. 353 pages. (Sampson Low, Marston, 1948.) 15s.

The story of Poland from 1939 to 1948. The author was deputy to General Sikorski and later Prime Minister of the Provisional Government in Warsaw.

THE STRUGGLE BEHIND THE IRON CURTAIN. By Ferenc Nagy. Large post 8vo. 471 pages. (Macmillan, New York, 1948.) 30s.

The story of the domination of the Communists in Hungary as told by a former Prime Minister.

THE MEANING OF MARXISM. By G. D. H. Cole. Crown 8vo. 302 pages. (Victor Gollancz, 1948.) 6s.

CIVILIZATION ON TRIAL. By Arnold J. Toynbee. Large post 8vo. 263 pages. (Oxford University Press, 1948.) 12s. 6d.

THE TRAVELS OF THE ABBÉ CARRÉ IN INDIA AND THE NEAR EAST, 1672 TO 1674. Volume Three. Medium 8vo. 307 pages. (The Hakluyt Society, 1948.) Series II. Volume XCVII.

THE MARTELLO TOWERS OF ENGLAND. By Hilary P. Mead. Pamphlet. 23 pages. (Reprinted from *The Mariner's Mirror*, 1948.)

THE LIFE OF CHIANG KAI-SHEK. By S. I. Hsiung. Large post 8vo. 398 pages. (Peter Davies, 1948.) 15s.

MY LIFE OF STRIFE. By Lord Croft. Medium 8vo. 384 pages. (Hutchinson, 1948.) 21s.

THE MEMOIRS OF CORDELL HULL. 2 Volumes. By Cordell Hull. Medium 8vo. 1,804 pages. (Hodder and Stoughton, 1948.) 50s.

NAVAL

THE DURABLE MONUMENT. HORATIO NELSON. By Admiral Sir W. M. James. Demy 8vo. 312 pages. (Longmans, 1948.) 15s. Presented by the Publishers. (See Review in this JOURNAL.)

TRAFALGAR PLANS. By Rear-Admiral A. H. Taylor. 6 pages. (1937.) Presented by Rear-Admiral A. H. Taylor.

FROM CARRACK TO CLIPPER. A Book of Sailing-Ship Models. Second edition. By Frank C. Bowen. Crown 4to. 74 pages. (Halton and Co., 1948.) 18s.

THE SHIPWRIGHT'S TRADE. By Sir Westcott Abell. Medium 8vo. 219 pages. (Cambridge University Press, 1948.) 21s.

THE DEVELOPMENT OF THE TORPEDO. By Commander Peter Bethell, R.N. Pamphlet. 28 pages. (Reprinted from *Engineering*, 1948.) Presented by the Author.

BATTLE REPORT. VOLUME IV. THE END OF AN EMPIRE. Edited by Walter Karig. Medium 8vo. 532 pages. (Rinehart, U.S.A., 1948.) 31s. 6d.

This volume covers the actions of the U.S. Navy in the North-West Pacific in the final mopping up of the Japanese which culminated in the Battle for Leyte Gulf.

"THE MED." The Royal Navy in the Mediterranean, 1939–1945. By Rowland Langmaid. Crown 4to. 130 pages. (Batchworth Press, 1948.) 21s. Presented by the Publishers. (See Review in this JOURNAL.)

BOUGAINVILLE AND THE NORTHERN SOLOMONS. By Major John N. Rentz. Crown 4to. 166 pages. (U.S. Marine Corps, 1948.) Presented by the United States Marine Corps.

COMMANDO MEN. The Story of a Royal Marine Commando in North-West Europe. By Bryan Samain. Demy 8vo. 188 pages. (Stevens, 1948.) 10s. 6d. Presented by the Publishers. (See Review in this JOURNAL.)

THE BISMARCK EPISODE. By Captain Russell Grenfell, R.N. Demy 8vo. 219 pages. (Faber and Faber, 1948.) 12s. 6d. Presented by the Publishers. (See Review in this JOURNAL.)

WALKER'S GROUPS IN THE WESTERN APPROACHES. By Commander D. E. G. Wemyss, R.N. Demy 8vo. 172 pages. (Liverpool Daily Post and Echo, 1948.) 12s. 6d. Presented by the Publishers. (See Review in this JOURNAL.)

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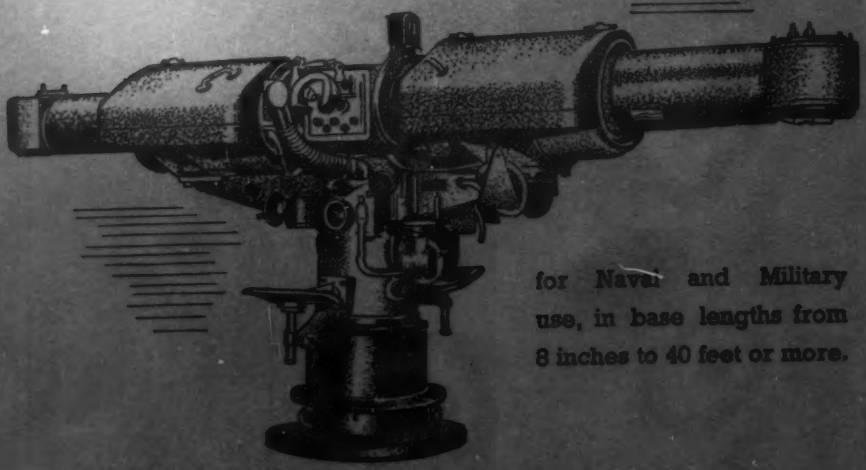

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